5.0 AIR QUALITY

Section 5, Air Quality, addresses physical changes to air resources from all activities associated with implementation of any of the project alternatives. The impact analysis focuses on chemical application and operational emissions including the potential for objectionable odors. The potential for impacts to human health is evaluated in Section 14, Human and Ecological Health Concerns, and Appendix J, Human and Ecological Health Risk Assessment.

5.1 Environmental Setting/Affected Environment

Lake Davis is located in Plumas County, California, in the Sierra Nevada range north of Sierra Valley. Grizzly Valley Dam, at the southern end of the reservoir, lies approximately five miles north of the City of Portola. The City of Portola has a population of approximately 2,227 residents. The closest densely populated area to the City of Portola is Reno, Nevada, approximately 49 miles to the southeast. The project area is defined as Lake Davis and the area encompassing its tributaries, covers approximately 28,000 acres.

5.1.1 Study Area

The project area includes the entire Davis Lake watershed, and Big Grizzly Creek from Grizzly Valley Dam to its confluence with the Middle Fork Feather River in Plumas County.

Implementation of the Proposed Project or any project alternative could result in impacts to air quality on both a local and regional scale. For example, operational emissions could impact air quality on a local scale, typically within five miles of the source. Therefore, a five mile radius from the emission source site would be considered as the local area of influence.

Air quality emissions may also result in regional impacts. For example, construction emissions may be transported over long distances before impacting air quality. To account for potential long-range transport, the regional area of interest is the jurisdiction of the Northern Sierra Air Quality Management District (NSAQMD), which includes Nevada, Plumas, and Sierra counties. The NSAQMD is required by state law to achieve and maintain the Federal and State Ambient Air Quality Standards, which are air quality standards set at levels that will protect the public health. Both Federal and State standards can be found in Table 5.1-1.

The Lake Davis Pike Eradication Project lies entirely within the Mountain Counties Air Basin (MCAB), consisting of seven air districts, including NSAQMD. The project is located within the Mountain Counties Intrastate Air Quality Control Region (AQCR), which includes Amador, Calaveras, Mariposa, Nevada, Plumas, Sierra, and Tuolumne counties, and portions of El Dorado and Placer counties. AQCRs were established by the Clean Air Act (CAA) as a method of dividing the country into regional air basins based on air pollution being a regional problem and not limited to political or state boundaries.

Table 5.1-1. California and Federal Ambient Air Quality Standards and Plumas County Attainment Status

Air Pollutant	State Standard Concentration/ Averaging Time	Plumas County Attainment Status – State	Federal Primary Standard Concentration/ Averaging Time	Plumas County Attainment Status – Federal	Most Relevant Effects
Ozone (O_3)	0.070 ppm (137 µg/m^3)*, 8-hour average	In April 2006 the Office of Administrative Law approved amendments to the regulations for ozone. The new standards became effective on May 17, 2006.	0.08 ppm, 8-hour average** (157 µg/m^3)	Attainment	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
	0.09 ppm, 1-hour average (180 µg/m^3)	Unclassified***	None	The Federal 1-hour O_3 standard was revoked by U.S. EPA on June 15, 2005.	
Carbon Monoxide (CO)	9.0 ppm, 8-hour average (10 mg/m^3)	Attainment	9 ppm, 8-hour average (10 mg/m^3)	Attainment	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
	20 ppm, 1-hour average (23 mg/m^3)	Attainment	35 ppm, 1-hour average (40 mg/m^3)	Attainment	

Table 5.1-1. California and Federal Ambient Air Quality Standards and Plumas County Attainment Status

Air Pollutant	State Standard Concentration/ Averaging Time	Plumas County Attainment Status – State	Federal Primary Standard Concentration/ Averaging Time	Plumas County Attainment Status – Federal	Most Relevant Effects
Nitrogen Dioxide ($N0_2$)	0.25 ppm, 1-hour average (470 µg/m^3)	Attainment	0.053 ppm, annual arithmetic mean (100 µg/m^3)	Attainment	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide ($S0_2$)	0.04 ppm, 24-hour average (105 µg/m^3)	Attainment	0.030 ppm, annual arithmetic mean (80 µg/m^3)	Attainment	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
	0.25 ppm, 1-hour average (655 µg/m^3)	Attainment	0.14 ppm, 24-hour average (365 µg/m^3)	Attainment	
Suspended Particulate Matter (PM_{10})	20 µg/m^3, annual geometric mean	Nonattainment - In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.	50 µg/m^3, annual arithmetic mean	Attainment	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
			150 µg/m^3, 24-hour average		

Table 5.1-1. California and Federal Ambient Air Quality Standards and Plumas County Attainment Status

Air Pollutant	State Standard Concentration/ Averaging Time	Plumas County Attainment Status – State	Federal Primary Standard Concentration/ Averaging Time	Plumas County Attainment Status – Federal	Most Relevant Effects
Particulate Matter ($PM_{2.5}$)	50 µg/m^3, 24-hour average		15 µg/m^3, annual arithmetic mean		(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
	12 µg/m^3, annual arithmetic mean	Unclassified except for Portola Valley which is Nonattainment – In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}***	65 µg/m^3, 24-hour average	Attainment	
Sulfates	25 µg/m^3, 24-hour average	Attainment	None	NA	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m^3, 30-day average	Attainment	1.5 µg/m^3, calendar quarter	Attainment	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Hydrogen Sulfide (H_2S)	0.03 ppm (42 µg/m^3)	Unclassified***	None	NA	Severe irritant to eyes and mucous membranes.

Table 5.1-1. California and Federal Ambient Air Quality Standards and Plumas County Attainment Status

Air Pollutant	State Standard Concentration/ Averaging Time	Plumas County Attainment Status – State	Federal Primary Standard Concentration/ Averaging Time	Plumas County Attainment Status – Federal	Most Relevant Effects
Visibility-Reducing Particles	Insufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hour average (10 a.m. to 6 p.m.)	Unclassified***	None	NA	Visibility impairment on days when relative humidity is less than 70%

Notes:

µg/m^3 = microgram per cubic meter
ppm = parts per million
* Parenthetical value is an approximately equivalent concentration.
** The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
***Unclassified = A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
***Source**: Bay Area Air Quality Management District, Ambient Air Quality Standards & Bay Area Attainment Status*

5.1.2 Climate and Weather

Lake Davis is located at an elevation of 5,775 feet in the Sierra Nevada range, north of the City of Portola (at an elevation of 4,860 feet). The weather in the Lake Davis and the City of Portola area is seasonal. Temperatures in the winter months average a low of 19.6º Fahrenheit, and temperatures in the summer months average a high of 82.5º Fahrenheit. Average precipitation in the Lake Davis basin ranges from 21 to 40 inches, and generally consists of heavy snowfall in the winter months.

5.1.3 Existing Conditions

The NSAQMD maintains a network of air quality monitoring stations within its jurisdiction. The nearest air monitoring station to the project area is maintained in the City of Portola on Nevada Street, approximately five miles south of the Grizzly Valley Dam, and is considered within the study area. Air monitoring at the Nevada Street station is limited to $PM_{2.5}$, although PM_{10} was monitored from 1995 to mid-2000. The $PM_{2.5}$ sampler was installed in 1999. Data from 1999 to 2005 demonstrate zero exceedances of the annual Federal $PM_{2.5}$ standard and a single day with an exceedance of the 24-hour Federal standard in 1999. When evaluated to exclude wildfires and other Exceptional/Natural Events, there are zero days with any exceedances (NSAQMD 2006c).

5.1.4 Ambient Air Quality Standards and Attainment Status

In 1970, the CAA was passed to establish Federal standards for emission of various air pollutants, to provide for the regulation of emissions through State Implementation Plans (SIPs), to prevent significant deterioration in areas where air quality exceeds national standards, and to provide for improved air quality in areas that do not meet federal standards (nonattainment areas). The AQCRs are geographical units with boundaries that are not necessarily coincidental to political or state boundaries and that share common air pollution issues.

The U.S. Environmental Protection Agency (USEPA) established the Federal National Ambient Air Quality Standards (NAAQS) for criteria pollutants to protect human health (primary standards) and public welfare (secondary standards, such as damage to vegetation). California established its own set of ambient air quality standards (CAAQS) for the criteria pollutants. The CAAQS are typically more stringent than the NAAQS.

Regional air basins are designated as either in attainment of the NAAQS or as nonattainment for violating the NAAQS. States or AQCRs that are nonattainment must require control equipment on their stationary sources in order to reduce criteria pollutants. The NAAQS address the following criteria pollutants:

- Ozone (O_3);
- Nitrogen dioxide (NO_2);
- Carbon monoxide (CO);
- Sulfur dioxide (SO_2);

- Particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$);
- Particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}); and
- Lead (Pb).

The health effects associated with each pollutant are shown on Table 5.1-1. This table also summarizes the state and Federal primary and secondary standards for the six pollutants, and the averaging time for determining compliance with the standards. It also includes the Plumas County's attainment status for each pollutant and standard.

5.1.4.1 Ozone (O_3)

Ozone is a photochemical oxidant and the major component of smog. While ozone in the upper atmosphere is beneficial for shielding the earth from harmful ultraviolet radiation from the sun, high concentrations at ground level cause health problems due to lung irritation. Ozone is generated by a complex series of chemical reactions between Volatile Organic Compounds (VOCs) and nitrogen oxides (NO_x) in the presence of ultraviolet radiation. High ozone levels result from VOCs and NO_x emissions from vehicles and industrial sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, and intense sunlight. For this reason, VOCs and NO_x are considered precursors to ozone and are consequently regulated as ozone. The MCAB did not participate in the Early Action Compact (EAC) and is no longer subject to the 1-hour ozone standard, and is therefore subject to the new 8-hour ozone standard. *Plumas County is currently in attainment of the Federal 8-hour ozone standard.*

5.1.4.2 Nitrogen Dioxide (NO_2)

NO_x emissions are primarily generated from the combustion of fuels. NO_x includes nitric oxide (NO) and nitrogen dioxide (NO_2). Because NO converts to NO_2 in the atmosphere over time and NO_2 is more toxic than NO, NO_2 is the listed criteria pollutant. As a gas, it can penetrate deep into the lungs where tissue damage occurs. The control of NO_x is also important because of its role in the formation of ozone. *There are currently no attainment designations for the Federal nitrogen dioxide standard.*

5.1.4.3 Carbon Monoxide (CO)

Carbon monoxide (CO) is a product of incomplete combustion, principally from automobiles and other mobile sources of pollution. CO emissions from wood-burning stoves and fireplaces can also be measurable contributors. The major immediate health effect of CO is that it competes with oxygen in the blood stream and can cause death by asphyxiation. However, concentrations of CO in urban environments are usually only a fraction of those levels where asphyxiation can occur. Peak CO levels occur typically during winter months, due to a combination of higher emission rates and stagnant weather conditions, such as ground-level radiation inversions. *Currently, Plumas County is in attainment of the Federal CO standard.*

5.1.4.4 Sulfur Dioxide (SO_2)

Sulfur Dioxide ($SO_{2)}$ is produced when any sulfur-containing fuel is burned. Health and welfare impacts attributed to SO_2 are due to the highly irritant effects of sulfate aerosols, such as sulfuric acid, which are produced from SO_2. Natural gas contains trace amounts of sulfur, while fuel oils contain much larger amounts. SO_2 can increase the occurrence of lung disease and cause breathing problems for asthmatics. It reacts in the atmosphere to form acid rain, which is destructive to lakes, streams, crops and vegetation, as well as to buildings, materials, and works of art. All areas in the state are considered either attainment or unclassified for sulfur dioxide. A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment. *Plumas County is in attainment of the Federal SO_2 standard.*

5.1.4.5 Particulate Matter (PM)

Particulates in the air are caused by a combination of wind-blown fugitive or road dust, particles emitted from combustion sources (usually carbon particles), and organic sulfate and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and NO_x. Particulate matter may contribute to the development of chronic bronchitis and may be a predisposing factor to acute bacterial and viral bronchitis. Respirable particulate matter is referred to as PM_{10}, because it has a diameter size of equal to or less than 10 microns. Respirable particulate can contribute to increased respiratory disease, lung damage, cancer, premature death, reduced visibility, and surface soiling. In 1987, the USEPA adopted standards for PM_{10} and phased out the total suspended particulate standards that had been in effect until then. As discussed previously, the USEPA also recently adopted standards for $PM_{2.5}$. Fine particulates come from fuel combustion in motor vehicles and industrial sources, residential and agricultural burning, and from the reaction of NO_x, SO_x and organics. *Plumas County is in attainment of both the Federal PM_{10} and $PM_{2.5}$ standards.*

5.1.4.6 Lead

Lead exposure can occur through multiple pathways, including inhalation of air, and ingestion of lead in food caused by water, soil, or dust contamination. Excessive exposure to lead can affect the central nervous system. Lead gasoline additives, non-ferrous smelters, and battery plants were historically a significant contributor to atmospheric lead emissions. Legislation in the early 1970s required gradual reduction of the lead content of gasoline over a period of time, which has dramatically reduced lead emissions from mobile and other combustion sources. In addition, unleaded gasoline was introduced in 1975, and together these controls have essentially eliminated violations of the lead standard for ambient air in urban areas. *Plumas County is designated as attainment for lead.*

5.1.4.7 Implementation of 8-hour Ozone Standard

On April 15, 2004, the USEPA designated as “nonattainment” areas throughout the country that exceeded the health-based standards for 8-hour ozone. On June 15, 2004, the USEPA issued the final rule to implement the 8-hour national ambient air quality ozone standard – Phase I. The Phase I final rule sets forth the classification scheme for nonattainment areas

and requires states' continued obligations with respect to existing 1-hour ozone requirements. On May 20, 2005, the USEPA took final action on reconsideration of certain aspects of its final rule to implement Phase I of the 8-hour national ambient air quality ozone standard. This action was in response to a petition for reconsideration submitted by Earthjustice on behalf of seven environmental organizations. On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment EAC areas by virtue of 40 CFR 50.9(b). Communities which enter into these EACs work to reduce ground-level ozone pollution at least two years earlier than required by the CAA.

Due to revocation of the 1-hour ozone standard, effective June 15, 2005, a recent notice (70 FR 44470) removed from 40 CFR Part 81 the 1-hour designations and classifications for all areas except EAC areas with deferred effective dates for their designations under the 8-hour ozone standard. The final Phase I rule that implements the 8-hour ozone standard provides generally that only the portion of the designated area for the 8-hour NAAQS that was designated as nonattainment for the 1-hour NAAQS is required to comply with 40 CFR 51.905(a). The maintenance plans required under Section 51.905(a)(3)(iii) and (4)(ii) must demonstrate maintenance only for the area designated as nonattainment (or attainment with a Section 175a maintenance plan) for the 1-hour NAAQS at the time of designation of the 8-hour NAAQS.

Notwithstanding NO_2 attainment status, NO_x and VOCs are ozone precursors and are considered nonattainment pollutants in ozone nonattainment areas. Therefore, they are subject to New Source Review (NSR), which is described further below.

5.1.5 Regulatory Environment

The project is potentially subject to a variety of Federal, State, and local regulations pertaining to operation of air emission sources. Air emissions are governed federally by the CAA and at the local level by the NSAQMD Rules and Regulations.

5.1.5.1 Federal

Clean Air Act

The CAA regulations (42 USC 7401 et seq., as amended in 1977 and 1990, and 40 CFR Parts 50 through 99) are the basic federal statutes and regulations governing air pollution in the United States. The following federal requirements have been reviewed for applicability to the project:

- New Source Performance Standards (NSPS);
- NSR/Prevention of Significant Deterioration (PSD);
- Title V operating permits;
- National Emission Standards for Hazardous Air Pollutants (NESHAPS);
- Chemical accident prevention provisions (Risk Management Plans); and
- The General Conformity Rule (for emissions not subject to NSR).

New Source Performance Standards

NSPS, codified at 40 CFR Part 60, establish requirements for new, modified, or reconstructed emission units in specific source categories. NSPS requirements include emission limits, monitoring, reporting, and record keeping. NSPS categories are typically targeted at permanently installed stationary equipment, and all combustion sources associated with this project would be considered off-road, non-road, mobile, and/or portable.

40 CFR Part 60, Subpart Kb, "Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984" applies to storage vessels with a capacity greater than or equal to 75 cubic meters that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. *Likely these tanks would remain on the vehicles they are delivered on, and therefore would be exempt from requirements of Subpart Kb.*

New Source Review Prevention of Significant Deterioration

The NSR permitting program was established as part of the 1977 Clean Air Act Amendments (CAAA). NSR is a preconstruction permitting program that ensures that air quality is not significantly degraded from the addition of new or modified major emissions sources.[1] In poor air quality areas, NSR ensures that new emissions do not inhibit progress toward cleaner air. In addition, the NSR program ensures that any large new or modified industrial source will be as clean as possible, and that the best available pollution control is utilized. The NSR permit establishes what construction is allowed, how the emission source is operated, and which emission limits must be met. Plumas County is in attainment of the NAAQS and therefore the project is not subject to NSR requirements.

If construction or modification of a major stationary source located in an attainment area would result in emissions greater than the significance thresholds (250 tons per year for the Lake Davis Pike Eradication Project), the project must be reviewed in accordance with Prevention of Significant Deterioration (PSD) regulations. However, none of the emissions that would result from the project would be from stationary sources of emissions, therefore PSD regulations do not apply. Estimated emissions from the nonstationary sources would be considered in a General Conformity (Section 176) analysis that would be conducted for the project if necessary (see below*). It is not expected that the project would be subject to PSD or NSR based on the emissions equipment being categorized as mobile, non-road, off-road, and/or portable.*

National Emissions Standards for Hazardous Air Pollutants

National Emissions Standards for Hazardous Air Pollutants (NESHAPs), codified in 40 CFR Parts 61 and 63, regulate hazardous air pollutant (HAP) emissions. Part 61 was promulgated prior to the 1990 CAAA and regulates only eight types of hazardous substances (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and

[1] A major stationary pollutant source in a nonattainment area has the potential to emit more than 100 tons per year of any criteria pollutant. In PSD areas, the threshold level may be either 100 or 250 tons per year, depending on the source.

vinyl chloride). The proposed liquid rotenone formulations contain 1,3,5-Trimethylbenzene, sec-Butylbenzene, 1-Butylbenzene, Isopropylbenzene, 1-Propylbenzene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, and 1-Butylbenzene; all of which are alkyl benzenes that contain a core benzene ring. These compounds are related to benzene in structure, and differ only by the addition of methyl, butyl, and propyl chains to the benzene ring, which contributes to their toxicological consideration. The addition of alkyl chains to the benzene ring, however, results in a reduction of toxicity. The 1990 CAAA established a list of 189 additional Hazardous Air Pollutants (HAPs), resulting in the promulgation of Part 63. Also known as the maximum achievable control technology (MACT) standards, Part 63 regulates HAP emissions from major sources of HAP emissions and specific source categories that emit HAPs. Part 63 considers any source with the potential to emit 10 tons per year of any single HAP or 25 tons per year of HAPs in aggregate as a major source of HAPs. In addition, Part 63 establishes HAP emission standards for specific categories. The project does not fall under any of these categories. *Although the proposed liquid rotenone formulations contain alkyl benzenes, the project would not be a significant source of HAPs based on the quantities of alkyl benzenes produced (see Tables 5.2-4, 5.2-12, 5.2-20, 5.2-28, and 5.2-36).*

Chemical Accident Prevention Provisions

The chemical accident prevention provisions, codified in 40 CFR 68, are Federal regulations designed to prevent the release of hazardous materials in the event of an accident and to minimize potential impacts if a release does occur. The regulations contain a list of substances and threshold quantities for determining applicability to stationary sources. *In the absence of stationary sources for the project, it would not be subject to these regulations.*

General Conformity Rule

The General Conformity Rule was designed to require Federal agencies, such as USFS, to ensure that proposed projects conform to the applicable SIP. General Conformity regulations apply to project-wide emissions of pollutants for which the project areas are designated as nonattainment (or, for ozone, its precursors NO_x and VOC) that are not subject to NSR and that are greater than the significance thresholds. Federal agencies are able to make a positive conformity determination for a proposed project if any of several criteria in the General Conformity Rule are met. These criteria include:

- Emissions from the project are specifically identified and accounted for in the SIP attainment or maintenance demonstration; or
- Emissions from the action are fully offset within the same area through a revision to the SIP or a similarly enforceable measure that creates emissions reductions so that there is no net increase in emissions of that pollutant.

A General Conformity analysis is required for pollutant emissions that would occur in nonattainment areas not subject to NSR. *Plumas County is in attainment of all NAAQS, and therefore is not subject to the General Conformity Rule.*

Title V Operating Permit

Title V of the Federal CAA requires individual states to establish an air operating permit program. The requirements of Title V are outlined in 40 CFR 70, and the permits required by these regulations are often referred to as Part 70 permits. NSAQMD regulates compliance with the permitting program under Title V in Plumas County. Title V applicability is discussed under "Local Regulations."

Occupational Safety and Health Act of 1970

Under the Occupational Safety and Health Act (OSHA) of 1970, the National Institute for Occupational Safety and Health (NIOSH) develops and periodically revises recommended exposure limits (RELs) for hazardous substances or conditions in the workplace. The *NIOSH Pocket Guide to Chemical Hazards* presents key information for 677 chemicals or substance groupings that are found in the work environment. The chemicals or substances contained in the *Pocket Guide* include all substances for which NIOSH has developed RELs. Substances with permissible exposure limits (PELs) are found in the OSHA General Industry Air Contaminants Standard (29 CFR 1910.1000).

29 CFR 1910.1000 contains three tables which list substances for which worker exposure is required to be controlled to listed levels. Several of the constituents of the liquid rotenone formulations are included in these tables. Additionally, worker exposure to benzene is also discussed in 29 CFR 1910.1028. Exemptions to this rule include benzene exposure at concentrations less than 0.1 percent by volume. Based on information in Tables *5.2-4, 5.2-12, 5.2-20, 5.2-28, and 5.2-36, levels for CFT Legumine® would be below 0.1, but levels for Noxfish® may be above 0.1.*

The RELs/PELs for all compounds associated with the liquid rotenone formulations are listed in Table 5.1-2 for reference. See Section 14 and Appendix J for a discussion of health risk to humans and ecology from the rotenone application.

5.1.5.2 State

The California Air Resources Board (CARB) was created by the Mulford-Carrell Air Resources Act in 1968. The CARB's primary responsibilities include: (1) develop, adopt, implement and enforce the state's motor vehicle pollution control program; (2) administer and coordinate the state's air pollution research program; (3) adopt and update the state's ambient air quality standards; (4) review the operations of the local air pollution control districts; and (5) review and coordinate the SIPs for achieving Federal ambient air quality standards.

State Implementation Plan

States are required to implement and enforce the NAAQS under a process called SIPs, which are approved by the USEPA. Generally the SIPs are comprised of air quality rules that are applicable to stationary sources that may emit criteria pollutants or HAPs. The original statutory deadline for attainment of the air quality standards will not be met and was extended for California.

Table 5.1-2. Recommended and Permissible Exposure Limits for Rotenone Formulation Constituents

Chemical Name	REL[a] / PEL[b]
CFT Legumine® Formulation	
rotenone	REL = 5 mg/m^3 PEL = 5 mg/m^3 (PELs are 8-hour TWAs[c]) The.
Rotenolone	No REL or PEL established
1-Methyl-2-pyrrolidinone (Methyl pyrrolidone)	No REL or PEL established
Diethylene glycol monoethyl ether(Diethylene glycol ethyl ether)	No REL or PEL established
1,3,5-Trimethylbenzene(*aka* mesitylene)	REL = 25 ppm (125 mg/m^3)
sec-Butylbenzene	No REL or PEL established
1-Butylbenzene(n-Butylbenzene)	No REL or PEL established
4-Isopropyltoluene(p-Isopropyltoluene)	No REL or PEL established
Methylnaphthalene	No REL or PEL established
Naphthalene	REL = 10 ppm and (50 mg/m^3) PEL = 10 ppm and (50 mg/m^3) (PELs are 8-hour TWAs[c, d])
Noxfish® Formulation	
rotenone	REL = 5 mg/m^3 PEL = 5 mg/m^3 (PELs are 8-hour TWAs[c])
Trichloroethene(Trichloroethylene)	REL, PEL = 8-hour time Weighted average = 100 ppm Acceptable Ceiling concentration = 200 ppm Acceptable maximum peak Above the acceptable ceiling concentration for an 8-hr shift = 300 ppm, Max duration is 5 mins in any 2 hours

Table 5.1-2. Recommended and Permissible Exposure Limits for Rotenone Formulation Constituents

Chemical Name	REL[a] / PEL[b]
Toluene	REL, PEL = 8-hour time Weighted average = 200 ppm Acceptable Ceiling concentration = 300 ppm Acceptable maximum peak Above the acceptable ceiling concentration for an 8-hr shift = 500 ppm, Max duration is 10 mins
1,3- and/or 1,4-Xylene(M/p xylene)	REL = 100 ppm (435 mg/m^3) PEL = 100 ppm (435 mg/m^3)
1,2-Xylene(o xylene)	REL = 100 ppm (435 mg/m^3) PEL = 100 ppm (435 mg/m^3)
Isopropylbenzene	No REL or PEL established
1-Propylbenzene(n-Propylbenzene)	No REL or PEL established
1,3,5-Trimethylbenzene	REL = 25 ppm (125 mg/m^3)
1,2,4-Trimethylbenzene	REL = 25 ppm (125 mg/m^3)
1-Butylbenzene(n-Butylbenzene)	No REL or PEL established
4-Isopropyltoluene(p-Isopropyltoluene)	No REL or PEL established
Naphthalene	REL = 10 ppm (50 mg/m^3) PEL = 10 ppm (50 mg/m^3) (PELs are 8-hour TWAs[c, d])

Source: http://a257.g.akamaitech.net/7/257/2422/08aug20051500/edocket.access.gpo.gov/cfr_2005/julqtr/pdf/29cfr1910.1000.pdf

[a]RELs are based on NIOSH Pocket Guide to Chemical Hazards, http://www.cdc.gov/niosh/npg/

[b]PELs are based on 29 CFR 1910.1000

[c]Milligrams of substance per cubic meter of air and should be considered exact

[d]Parts of vapor or gas per million parts of contaminated air by volume at 25ºC and 760 torr.

TWA = time-weighted average

The Federal CAA requires each state to prepare a SIP to demonstrate how it will attain the NAAQS within the federally imposed deadlines. The CARB reviews the SIP. Local districts adopt new rules to demonstrate attainment of the NAAQS by reducing emissions.

California Clean Air Act

In 1989, California established state ambient air quality standards, including stringent enforcement of the NAAQS and additional standards for visibility reducing particles, sulfates, and hydrogen sulfide. Local districts prepare air quality plans to demonstrate how the ambient air quality standards will be attained. Plumas County must comply with the California CAA. The Portola Valley portion of Plumas County is defined as the portion of the county within Super Planning Watersheds #55183301, #55183302, #55183303, and #55183304, as defined in CalWater, version 2.2, 1999.[1] Lake Davis is not located within the boundaries of Portola Valley, as defined above, but is just to the north of the boundary or Super Planning Watershed #55183301. The City of Portola is divided by the boundary of the area known as the Portola Valley along the Middle Fork Feather River. The portion of the city to the north of the river is within Portola Valley, and the portion of the city to the south of the river is not.

The Portola Valley is designated as nonattainment of the state $PM_{2.5}$ standard while the remainder of Plumas County is unclassified or in attainment of all other state standards. (As stated above, a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment). The CAAQS and the NAAQS and the health effects associated with each pollutant are shown in Table 5.1-1.

Particulate Sulfates

Particulate sulfates are the product of further oxidation of SO_2. Sulfate compounds consist of primary and secondary particles. Primary sulfate particles are directly emitted from open pit mines, dry lakebeds, and desert soils. Fuel combustion is another source of sulfates, both primary and secondary. Secondary sulfate particles are produced when oxides of sulfur (SO_x) emissions are transformed into particles through physical and chemical processes in the atmosphere. Particles can be transported long distances. *Plumas County is in attainment for the state particulate sulfates standard.*

Other State-Designated Criteria Pollutants

Along with sulfates, California has designated hydrogen sulfide and visibility-reducing particles as criteria pollutants, in addition to the federal criteria pollutants. The entire state is in attainment for visibility-reducing particles. *Plumas County is considered unclassified for the hydrogen sulfide standard attainment. It is also in attainment of the state lead standard.*

Toxic Air Contaminant Identification and Control Act

The CARB's statewide comprehensive air toxics program was established in the early 1980s. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's

[1] http://www.ca.nrcs.usda.gov/features/calwater/index.html

program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act supplements the AB 1807 program, requiring a statewide air toxics inventory, notification of persons exposed to a significant health risk, and facility plans to reduce the risks identified.

Under AB 1807, the CARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, the CARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community" (Health and Safety Code section 39666(f)). AB 1807 also requires the CARB to use available information gathered from the AB 2588 program to include in the prioritization of compounds.

In 1993, the California Legislature amended the AB 1807 program for the identification and control of toxic air contaminants (TACs) (AB 2728). Specifically, AB 2728 required the CARB to identify the 189 Federal hazardous air pollutants as TACs (see discussion of HAPs under the Federal regulations, (Section 5.1.4.1). For those substances that have not previously been identified under AB 1807 and identified under AB 2728, health effects values would need to be developed.

TACs associated with the project include benzenes and naphthalenes from the application of rotenone and diesel exhaust from mobile equipment proposed for the application. The CARB has developed Air Toxics Control Measures (ATCMs) for specific chemicals and their uses. Although there have been several ATCMs promulgated for diesel exhaust, none applies to uses proposed for the project. The ATCMs promulgated include Stationary Compression Ignition Engines and Transport Refrigeration Units. The equipment proposed for the pike eradication project would be considered mobile, non-road, off-road or portable, not stationary.

Safe Drinking Water and Toxic Enforcement Act of 1986

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) was enacted as a ballot initiative in November 1986. The proposition was intended by its authors to protect California citizens and the state's drinking water sources from chemicals known to cause cancer, birth defects, or other reproductive harm, and to inform citizens about exposures to such chemicals. Proposition 65 requires the governor to publish, at least annually, a list of chemicals known to the state to cause cancer or reproductive toxicity.

Updated on February 3, 2006, it lists the following chemicals that are expected from the application of one or both of the liquid rotenone formulations: diesel engine exhaust, N-methylpyrrolidone, naphthalene, toluene, and trichloroethylene.

5.1.5.3 Local

State law establishes local air pollution control districts and air quality management districts with the responsibility for regulating emissions from stationary sources. Thus, the NSAQMD would be the regulating agency.

NSAQMD Rules and Regulations

Air emission sources in Plumas County are required to meet state air emission standards and to comply with requirements codified in the NSAQMD Rules and Regulations. The project is unique in that it would be a short-term, temporary project but is not considered a construction project. Sources of combustion emissions for the project include vehicles, watercraft, and pumps, which are categorized as mobile and non-road/off-road, watercraft, and portable sources, respectively. The NSAQMD governs stationary sources of equipment and also has a portable equipment registration program. Mobile sources are governed by the CARB in California. It is not anticipated that an Authority to Construct, Permit to Operate, or Title V Operating Permit would be necessary for the project, however the pumps for the rotenone application (and additional pumps for dewatering below deadpool levels for Alternative E) would need a portable equipment registration. However, due to the unique nature of the project, the DFG would work with the NSAQMD to determine if certain types of equipment may require a permit to operate and/or an inspection by NSAQMD staff. Additionally, the application of the rotenone and the exposure of the reservoir bed may result in particulate matter and fugitive dust emissions and would be subject to NSAQMD rules.

The rules that may apply to the project are listed below:

- **Rule 207 – Particulate Matter.** Rule 207 states that a person shall not release or discharge into the atmosphere from any source or single processing unit, exclusive of sources emitting combustion contaminants only, particulate matter emissions in excess of 0.1 grains per cubic foot of dry exhaust gas at standard conditions.
- **Rule 226 – Dust Control.** The purpose of this rule is to reduce and control fugitive dust emissions to the atmosphere. It applies to various air emissions activities, including "operation of machines or equipment." It requires a person to take all reasonable precautions to prevent dust emissions, and lists these reasonable precautions as cessation of operations, cleanup, sweeping, sprinkling, compacting, enclosure, chemical or asphalt sealing, and use of wind screens or snow fences.
- **Rule 523 – Portable Equipment Registration.** The purpose of this rule is to provide an administrative mechanism, and establish standards for registration of certain portable emissions units for operation at participating districts throughout the state of California. The Districts may update, through rulemaking, the emissions standards for new emissions units as more effective control technology becomes available. Portable equipment is defined as any emissions unit that, by itself or in or on a piece of equipment, is portable, meaning designed to be and capable of being carried or moved from one location to another. Indicators of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, platform, or mounting.

5.2 Environmental Impacts and Consequences

The following section discusses the potential impacts to air quality associated with the Proposed Project and alternatives. The air quality impacts analysis provides estimates of air emissions for the mobile fleet, rotenone mixing in Lake Davis, and fugitive dust. These emissions are compared against the impact significance criteria presented in Section 5.3

below. Significant impacts are summarized for each alternative where one or more impacts were identified.

This analysis focuses on potential impacts to air quality**.** See Section 14, Human and Ecological Health Concerns, and Appendix J for an analysis of health risk to humans and animals that includes evaluation of inhalation risk.

5.2.1 Evaluation Criteria and Environmental Concerns

5.2.1.1 Impact Significance Criteria

Impacts are considered adverse and significant if the project air emissions levels exceed standards and promulgated regulations at the state or federal level. For this analysis and based on the CEQA checklist, impacts from air emissions would be considered significant if the project would:

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable national or state ambient air standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Conflict with or obstruct implementation of the applicable air quality plan; or
- Create objectionable odors affecting a substantial number of people.

Additionally, impacts from air emissions would be considered significant if the project would:

- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose the public (especially schools, day care centers, hospitals, retirement homes, convalescence facilities, and residences) to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to one in a million and/or a Hazard Index (HI) (non-cancerous risk) greater than or equal to 0.1; or
- Impair air quality in a mandatory Class I Federal area.

Environmental issues associated with air quality include the following:

- Objectionable odors to sensitive receptors from rotenone application and decaying fish;
- Elevated levels of air pollutant emissions from equipment required for application (including dewater);

- Particulate dust from equipment and vehicle use;
- Dust from powdered rotenone application.

All of the project alternatives involve transportation/hauling and staging of chemicals and/or equipment with the exception of Alternative E and the No Project alternative, which do not include a chemical application. Fugitive dust impacts from the exposed reservoir bed are a potential concern for the Proposed Project/Proposed Action, and Alternatives A, B, C, and E. Chemical emissions from rotenone application to Lake Davis are considered for all alternatives with the exception of Alternative E. Application to tributaries is less than 50 pounds and therefore is less than significant.

As discussed above under Regulatory Environment, the Proposed Project is unusual in that it is short-term and temporary in nature, yet is not considered a construction project. It is expected that the equipment proposed for all of the alternatives, with the exception of No Project, would be categorized as mobile, off-road, non-road, and temporary. Most local air districts either establish thresholds of significance for construction projects or, in a more recent trend, discourage emissions estimations altogether for construction project in favor of requiring and strongly encouraging specific mitigation measures in order to reduce the impacts to air quality from construction projects. Therefore, there are no specific thresholds of significance that would be appropriate to compare the projected emissions for the Proposed Project with. Significance determination is based on the following three factors: 1) CEQA and other appropriate criteria as listed above, 2) the short-term, temporary nature of the project, and 3) the implementation of Forest Closure 2 for all alternatives with the exception of the No Project alternative.

Chemical emissions from the use of rotenone are included for reference only and this section is focused on impacts to air resources, not to humans. Please see Section 14, Human and Ecological Health Concerns, and Appendix J for a risk analysis to humans and animals based on estimated emissions from the powdered rotenone formulation and the two liquid rotenone formulations under consideration.

Neither the Proposed Project nor any of the project alternatives would result in a change to any state or Federal air quality attainment designation.

Potential air impacts are evaluated for each of the alternatives below.

5.2.2 Evaluation Methods and Assumptions

The methodology used to prepare this analysis is as follows:

1. Develop operating scenarios consistent with the project descriptions based on project information developed by the DFG, Project Team Members, and technical review of the 1997 Lake Davis Study.
2. Develop emission estimates for the chemical application, mobile fleet, and use of equipment based on the operating scenarios and various project alternatives.
3. Estimate maximum day and entire project emission estimations using screening-level public domain simulation software and information.

4. Estimate the fate transfer of chemicals during the initial application/mixing period using the USEPA WATER9 water simulation software.
5. Estimate the overall project emission factor using a material balance approach and the calculated/simulated emission factors from numbers three and four mentioned above.
6. Determine the mobile fleet fuel consumption based on the mobile fleet equipment summary (application, reservoir mixing, equipment support, field observation) provided by the DFG. The equipment summary included number of vehicles/equipment, size, operating hours per day, operating hours per project and type of fuel. Based on the summary report, the fuel consumption rates were assigned using manufacturer's data, South Coast Air Quality Management District (SCAQMD) fuel consumption factors and CARB factors.
7. Estimate the mobile fleet emissions using SCAQMD emission factors and the calculated maximum fuel consumed per day and entire project.
8. Since several alternatives require a reduction in reservoir level and the use of equipment and vehicles (resulting in the disturbance of the reservoir bed), fugitive dust emissions were quantified using the SCAQMD - California Environmental Quality Act (CEQA) Air Quality Handbook.
9. Worker/staff transportation, chemicals to reservoir, dead fish from reservoir and other localized project operations (e.g. neutralization, mobilization, project staging) were quantified using procedures as outlined in the SCAMQD - CEQA Air Quality Handbook.

5.2.3 No Project/No Action

No Project/No Action (No Project) represents a continuation of the existing reservoir and fishery management practices as of September 2005 into the foreseeable future. These practices are consistent with the current, adopted plan to control pike. The goal of the current plan, known as the *Y2000 Plan* (DFG 2000), is to control the population of pike in Lake Davis and to keep the pike contained in the reservoir. There would be no forest closure, and recreation activity would continue, similar to recent years, with a decline in angling (see Section 11.2.3). The No Project Alternative would have no adverse impact on air quality.

5.2.4 Proposed Project/Proposed Action–15,000 Acre-Feet (Plus Treatment)

Under the Proposed Project/Proposed Action, the reservoir would be drawn down to 15,000 acre-feet and a liquid rotenone formulation (CFT Legumine® and/or Noxfish®) would be applied throughout the reservoir, tributary streams, and any pools, ponds or springs in the watershed potentially containing pike. Neutralization of the rotenone would be accomplished by either curtailing dam outflow and allowing natural detoxification in the reservoir and its tributaries, or by applying potassium permanganate ($KMnO_4$) to the dam's discharge water in Big Grizzly Creek. Project implementation would begin with reservoir drawdown in January, followed by rotenone application between mid-August and late October of 2007.

5.2.4.1 Amount of Piscicide Required

The total amount of Noxfish® or CFT Legumine® used would vary based on reservoir volume and inflow at the time of application. At the application rate of 0.33 gallon of Noxfish® or CFT Legumine® per acre foot of water, a 15,000 acre-feet reservoir volume would require 5,000 gallons of the formulation to achieve the concentration proposed. A maximum of 260 gallons are expected to be required for the treatment of the tributaries depending on flow rates, background demand, sedimentation, amount of vegetation during application, whether temporary upstream fish barriers can be effectively constructed, and other factors.

5.2.4.2 Access

Reservoir drawdown below 45,000 acre-feet may result in muddy and soft areas beyond the end of the Honker Cove, Camp Five, and Mallard Cove boat ramps. Landing mats or gravel may be installed from the end of the ramps to provide boat and vehicle access or boat ramps may be extended. In addition, portions of the reservoir may be treated by amphibious vehicles, boats, air boats, or other means, including piping of chemicals from a centralized location to the water for distribution.

5.2.4.3 Methodology

Using the available project information and consistent with federal, state and local regulations, the project analysis focuses on the application, mixing and neutralization aspects. Based on the projected application, schedule, and sequence, project emissions were estimated to determine the maximum daily and overall project contributions.

Air quality impacts due to the following proposed operations and activities were evaluated:

- Hauling chemicals to Lake Davis;
- Application of agent to eradicate the pike;
- Operational emissions – mobile equipment used for application of piscicide;
- Operational emissions – dust (exposed reservoir bed, access roads);
- Operational- manpower, traffic;
- Operational stationary equipment in support of dewatering/neutralization; and
- Dead fish retrieval and removal.

Table 5.2-1 summarizes the type of operation, type of emission and estimation technique used to estimate potential air quality impacts.

Table 5.2-1. Air Quality Estimation Summary

Task	Type of Pollutant	Estimation Technique
1. Application of Chemicals	Chemicals	Material Balance / Formulations / WATER9 Simplified Fate Calculations
2. Chemicals to Site	Priority Pollutants	SCAQMD CEQA Manual and Equipment Emission Factors
3. Equipment to Apply Chemicals and Mixing of Reservoir	Priority Pollutants	SCAQMD CEQA Manual and Equipment Emission Factors
4. Worker Commuting to Reservoir	Priority Pollutants	SCAQMD CEQA Manual and Equipment Emission Factors
5. Impact of Reduced level in Reservoir	Particulate Matter	SCAQMD CEQA Manual and Equipment Emission Factors
6. Neutralization Process	Chemicals	Material Balance
7. Reservoir Level Reduction (pumping and/or supplemental power)	Priority Pollutants	SCAQMD CEQA Manual and Equipment Emission Factors
8. Fish Removal	Priority Pollutants	SCAQMD CEQA Manual and Equipment Emission Factors
9. Transportation of Fish Off-site	Priority Pollutants	SCAQMD CEQA Manual and Equipment Emission Factors

Emission estimates included in this EIR/EIS are considered conservative due to the simplifying assumptions (as listed in each discussion of alternatives), including the use of default emission factors.

5.2.4.4 Application of Chemicals to Reservoir and Tributaries Piscicide Emissions (Toxic and Odor-related Compounds)

Chemical emissions associated with the actual application and mixing of piscicides were estimated using an overall material balance and WATER9 fate transfer equations for the air toxics compounds. The chemicals of concern screening list (February 3, 2006) for the application of rotenone include: n-methylpyrrolidone, naphthalene, toluene, and trichloroethylene. The entire chemical composition was evaluated to determine predictive worst-case emissions for both chemicals under consideration. Table 5.2-2 provides a summary of the Lake Davis characteristics at the proposed alternative level. In addition, the exposed shore and reservoir bed quantity are included. Table 5.2-3 provides the chemical application parameters for the Proposed Project.

Although the Proposed Project is to apply a liquid formulation in both the reservoir and in the tributaries, as stated in Section 2.3.2 of this EIR/EIS, if necessary, rotenone powder (Fish Toxicant Powder) would be combined with sand and gelatin to form sand-gelatin-rotenone balls to treat large pools, seeps, and springs. The balls would be prepared at an off-site laboratory and delivered to the project site. When applying these balls, small amounts of powdered rotenone may be released into the air, but only pesticide applicators in the vicinity would be exposed.

Table 5.2-2. Reservoir Parameters – Proposed Project

Proposed Project / Proposed Plan: Drawdown to 15,000 Acre-Feet		
Reservoir Parameters	**Parameter**	**Amount**
	Surface Area (Acres)	1,331
	Acre-Feet Water	15,000
	Depth (Feet)	11
	Surface Area (Square Feet)	57,978,586
	Water (Gallons)	4,887,765,000
	Water (Pounds)	40,763,960,100
Exposed Reservoir bed	Acres	2,500

Table 5.2-3. Chemical Application Parameters – Proposed Project

Piscicide Parameters		**Total Amount Chemical in Reservoir**
		Gallons: 4,860 (Equivalent)
	Neat Conc. in Formulation mg/L	**Pounds: 40,540**
Ingredient		**Pounds Chemical in Formulation**
CFT Legumine®		
Rotenone	43,200	1,821
Rotenolone	5,300	223
Naphthalene	350	15
1-Butylbenzene	80	3.37
1-Methyl-2-pyrrolidinone	90,000	3,794
Diethylene glycol monoethyl ether	569,000	23,983
1,3,5-Trimethylbenzene	4	0.17
sec-Butyl benzene	4	0.16
Methylnaphthalene	140	5.9
4-Isopropyltoluene	5	0.21
Noxfish®		
Rotenone	50,000	2,108
Trichloroethylene	73	3.1
Toluene	1,800	75
1,3- and/or 1,4-Xylene	610	26
1,2-Xylene	76	3.2
Isopropyl benzene	52	2.2
1-Propylbenzene	310	13
1,3,5-Trimethylbenzene	860	36
1,2,4-Trimethylbenzene	10,000	422
1-Butylbenzene	9,000	379
4-Isopropyltoluene	1,000	42
Naphthalene	70,000	2,951

Table 5.2-4 provides a summary of emissions on the maximum day (pounds/day or #/day) and for the entire project (main reservoir).

Table 5.2-4. Maximum Day (Acute) and Total Project Chemical Emissions – Proposed Project

Chemical	Total Pounds Applied To Reservoir In Formulation	Total Pounds To Air Maximum Day (#/Day)	Total Pounds To Air Entire Project (#/Project)
CFT Legumine®			
Rotenone	1,821	18	18
Rotenolone	223	202	202
Naphthalene	15	6.1	8.8
1-Butylbenzene	3.37	2.0	2.5
1-Methyl-2-pyrrolidinone	3,794	188	225
Diethylene glycol monoethyl ether*	23,983	0	0
1,3,5-Trimethylbenzene	0.17	0.13	0.14
sec-Butylbenzene	0.16	0.10	0.13
Methylnaphthalene	5.9	2.5	3.5
4-Isopropyltoluene	0.21	0.10	0.13
Noxfish®			
Rotenone	2,108	21	21
Trichloroethylene	3.1	2.5	2.74
Toluene	75	59	71
1,3- and/or 1,4-Xylene	26	13	17
1,2-Xylene	3.2	1.6	2.1
Isopropyl benzene	2.2	1.8	2.1
1-Propylbenzene	13	6.5	8.5
1,3,5-Trimethylbenzene	36	27	33
1,2,4-Trimethylbenzene	422	312	375
1-Butylbenzene	379	233	281
4-Isopropyltoluene	42	26	31
Naphthalene	2,951	1,284	1,751

Notes:

*Diethylene glycol monoethyl ether is considered non-volatile and therefore no emissions would result.

Simplifying Assumptions:

- For purposes of the air quality analysis, the entire chemical application was spread evenly over one day (10 hours), although it may take from one to three days depending on the volume of the reservoir at the time of the application;
- Tributary application is not part of the reservoir application;
- The USEPA WATER9 fate model was used as a screening tool to assess the percent portioned from a mixing tank configuration. The modeling concept was based on introduction of the "neat" chemical into the reservoir and the initial reservoir turn-

- The majority of the VOC would be released during the mixing and application process; and
- No computational modeling was conducted for reservoir application areas, dosage rates, mixing constants, or ambient air concentrations.

Use of Information

The emission estimates were used to evaluate the potential impact of emissions on nearby receptors and/or worker safety and health. Please see Section 14 for a discussion of potential risks to human health and ecology.

5.2.4.5 Application and Equipment Emissions (Priority Pollutants and Toxics)

During the application phase, temporary emissions would be generated by the application and equipment operation used to implement the proposed alternative. Application and equipment emissions were estimated using the equipment fleet summary, anticipated application sequence, determination of maximum daily and overall project equipment utilization, estimated total fuel use and application of emission factors for typical engines.

Default emission values were used due to the mixed use of equipment, short-term (one day) application process, and relatively short overall project length (three months). Application and equipment emission estimates were applied to chemical application and equipment scenarios by using a fleet mix of equipment to be used during application activities: loaders, trucks, scrapers, backhoes, water trucks, generators, chemical mixing, chemical application, reservoir mixing, site security and associated staff logistics. In addition, onsite dust generation and worker transportation related emissions were estimated. Table 5.2-5 summarizes the priority pollutants associated with the three identified operations.

Table 5.2-5. Summary of Priority Pollutants from Application and Equipment Operations – Proposed Project in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Transportation of Chemical to Reservoir	1	30	5	0.5	0.5
Mobile Combustion Equipment	607	28,870	953	42	63
Worker Vehicle (To/From Reservoir)	10	110	11	0	0
Total	618	29,010	969	43	64

Note:

Assumption: all activities are occurring simultaneously.

Sources: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 2000.

Emission Values for Portable and Stationary Engines SCAQMD AEIR 2005-2006 Default Setting.

5.2.4.6 Dust and Particulate Emissions Associated with Exposed Reservoir Bed and Traffic on Unpaved Roads/Surfaces

Part of the Proposed Project would require movement of various pieces of mobile equipment across unpaved roads and exposure of the reservoir bed during drawdown. SCAQMD CEQA Air Handbook, Chapter 9, defines the various air emission formulae and application methods to estimate the daily dust emissions. Calculation of particulate emissions from fugitive dust involves emissions from staging areas and the exposed surface of the reservoir bed. Table 5.2-6 summarizes the emissions associated with the site preparation and the exposed reservoir bed surface portion of the project.

Table 5.2-6. Fugitive Dust Emissions, General Equipment Activity and Exposed Reservoir bed – Proposed Project

Development of Temporary Staging Areas	Values
Temporary Staging Area[1]	1 acres graded/day
PM_{10} Emission Factor[2]	26.4#/acre/day
PM_{10} Maximum Day(uncontrolled)	26.4 #/day
PM_{10} -Peak Daily (#/day)[3, 4]	14 #/day
Stock Pile Area (ft^2)	200 (site balanced)
Emission Factor for Stock Pile (#/ft^2)	1.97#/1,000 (ft^2)[5]
Stock Pile Emissions (#PM_{10}/day)	0.4 #/day
Wind Erosion Reservoir bed and Exposed Areas	**Values**
Exposed Surface of Reservoir bed	2,500 acres
Estimated Surface of Reservoir bed Disturbed by Application/Equipment Operation[6]	3% of Total (75 acres)
Estimated Surface Remained Undisturbed and Sufficient Moisture Content[7]	97% of Total (2,425 acres)
PM_{10} Factor for Disturbed Area [2]	26.4#/acre/day
Total Exposed Reservoir bed PM_{10} Emissions	1,980 pounds/day
Total PM_{10}	1,995 pounds/day

Notes:
1 Estimated area disturbed per day (250 x 250 feet), grading would occur on the first and/or second day, after which plastic mats or hay bales would be installed.
2 EPA MRI Report emission factor
3 Assume 50% dust control by water suppression
4 Most conservative daily emission
5 Emission factor A9-9-E SCAQMD Air Handbook
6 Emission factor Table A9-9 SCAQMD Air Handbook
7 Emission factor ratio (97/3) based on engineering assessment of disturbed areas

The peak combined emissions of PM_{10} generated by the site preparation and travel across the reservoir bed is 1,995 pounds per day.

5.2.4.7 Neutralization

Draft neutralization options are provided in Section 2.3.4 and in Appendix E. Neutralization of the rotenone would be accomplished by either curtailing dam outflow and allowing natural detoxification in the reservoir and its tributaries, or by applying potassium permanganate

($KMnO_4$) to the dam's discharge water in Big Grizzly Creek. The strategies include four options, some of which propose water pumping with small ½ to 1 hp electric pumps, which would not produce air emissions. The air emissions impact of adding $KMnO_4$ would primarily be localized fugitive emissions depending on the proposed mixing and application practices. Based on good handling practices and the inorganic composition of permanganate, the emission of permanganate would be assumed practically non-detectable.

5.2.4.8 Reservoir Level Reduction (Pumping and/or Supplemental Power)

In most water years (27 out of 38 years of record) additional pumping is not anticipated for the Proposed Project to lower the reservoir to the 15,000 acre-foot volume (see Table 2.10-1). Additional pumping is not anticipated for the Proposed Project.

5.2.4.9 Fish Removal and Transportation

During the application process, dead fish would float to the surface and wash up on shore. It is estimated that approximately 100 tons of fish would be killed. Dead fish that float to the top of the reservoir or wash up on shore would be picked up for disposal. All dead fish that are retrieved would be loaded into a truck and hauled to a landfill (or other pre-approved facility). The proposed landfill is approximately 60 miles from Lake Davis.

It is assumed that each truck trailer (two trailers per truck) would haul approximately five tons of fish with silt carry-over to the landfill. A maximum day of fish retrieval is estimated to be two loads per truck. It is expected to take five days to haul the estimated 100 tons of dead fish. Table 5.2-7 summarizes the gathering, loading, and transportation of the dead fish based on two truck loads.

Table 5.2-7. Summary of Priority Pollutants from Removal and Transportation of Dead Fish – Proposed Project in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Gathering Dead Fish + Equipment to Load Trucks	5	16	42	4	3
Truck Trips to Landfill	2	60	10	1	1
Total Pounds per day	7	76	52	5	4
Total Pounds per Project[1]	35	380	260	25	20

Note:

1. Based on two truck trips per day of 5 tons of fish each (two trailers per truck), for a total of five days to haul 100 tons.

Source: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 1993.

5.2.4.10 Overall Project Pollutant Emissions

Table 5.2-8 below lists the daily project emissions for the Proposed Project for the priority pollutants.

Table 5.2-8. Summary of Priority Pollutants for Proposed Project in Pounds per Day – populate following receipt of updated modeling results

Emission Source Category	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Application and Equipment Operations	618	29,010	969	43	64
Fugitive Dust Emissions	--	--	--	--	1,995
Removal and Transport of Dead Fish	35	380	260	25	20
Total Pounds per day	**653**	**29,390**	**1,229**	**68**	**2,079**

5.2.4.11 Potential Impacts

Sensitive Receptors Exposure

Sensitive receptors in the area include local residences in the vicinity of Lake Davis and the two children's camp facilities on Big Grizzly Creek south of Lake Davis. Air emissions could be substantial on days when multiple pieces of emissive equipment are operating. Emission levels of carbon monoxide and particulate matter would have the greatest amount of emissions. The DFG would be required to comply with NSAQMD Rule 226, Dust Control, in order to reduce emissions of fugitive dust. The rule tends to control dust from disturbed land areas, which would include all disturbed areas of the exposed reservoir bed. Minimization measures would not generally apply to the exposed shore where no project activity was taking place. All emissions, including CO, would be short-term and temporary. Additionally, proposed Forest Closure 2 would minimize other potential receptors from being exposed to potential substantial pollutant concentrations.

In order to minimize the exposure of sensitive receptors to substantial pollutant concentrations, including particulate matter, the DFG would comply with NSAQMD Regulation 226, Dust Control. Compliance with this rule requires that the following reasonable precautions be taken in order to prevent the release of fugitive dust: cessation of operations, cleanup, sweeping, sprinkling, compacting, enclosure, chemical or asphalt sealing, and use of wind screens or snow fences.

Information on chemical emissions for rotenone is included for reference only. Please see Section 14 for a discussion of potential risks to human health and ecology.

Impact AQ-1: The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations from the use of combustion equipment and the disturbance of soil. The adverse impact is considered less than significant prior to implementation of further minimization measures described below.

Mitigation AQ-1: No mitigation is required. However, the DFG should plan to use alternative fuels to traditional diesel fuel where feasible to reduce the emissions, and specifically toxic emissions, from the equipment operation.

Objectionable Odors

The use of the rotenone and the resulting deceased fish would result in objectionable odors for all persons in the vicinity of the reservoir including agency staff, members of the media, and interested citizens. Odors would be short-term and temporary, and the DFG would implement a plan for the rapid removal of the deceased fish in order to minimize odor levels. Additionally, proposed Forest Closure 2 would minimize the number of people exposed to the objectionable odors.

In order to minimize the effects of objectionable odors to a substantial number of people, the DFG would implement a "Dead Fish Disposal and Removal Plan" in order to capture and remove the deceased fish as quickly as possible to minimize exposure to objectionable odors.

Impact AQ-2: The Proposed Project would not create objectionable odors affecting a substantial number of people. The adverse impact is considered less than significant prior to implementation of minimization measures described above that have been incorporated into the project.

Mitigation AQ-2: No mitigation is required.

Fugitive Dust

The use of vehicles and equipment would create particulate dust and would impact workers in the vicinity of the reservoir during operation of the equipment. Dust emissions would be limited to the operation of the equipment. Proposed Forest Closure 1 would limit the disturbance of the reservoir bed to activities considered essential to the project. Proposed Forest Closure 2 would minimize the number of people exposed to fugitive dust. It is expected that air quality conditions would benefit from the forest closures proposed for the project as a result of reduced emissions from decreased recreation activities, including off-road vehicles, in the project area.

In order to minimize the creation of particulate dust from vehicles and equipment, the DFG would comply with NSAQMD Regulation 226, Dust Control. Compliance with this rule requires that the following reasonable precautions be taken in order to prevent the release of fugitive dust: cessation of operations, cleanup, sweeping, sprinkling, compacting, enclosure, chemical or asphalt sealing, and use of wind screens or snow fences. The rule tends to control dust from disturbed land areas, which would include all disturbed areas of the exposed reservoir bed. Minimization measures would not generally apply to the exposed shore where no project activity was taking place.

Impact AQ-3: The Proposed Project would create particulate dust from the use of construction-type equipment and vehicles. However, due to the short-term nature of the project and the limited receptors in the area, the adverse impact is considered less than significant prior to implementation of minimization measures described above.

Mitigation AQ-3: No mitigation is required. However, the DFG will implement a telephone hotline which members of the public could use to relay concerns regarding the project, including issues associated with air quality.

5.2.5 Alternative A: 15,000 Acre-feet (Plus Treatment Including Powder)

Under Alternative A, the eradication of pike from Lake Davis would be accomplished by drawing down the reservoir to 15,000 acre-feet and applying powdered rotenone to the reservoir, and liquid rotenone to the tributary streams, and any pools, ponds or springs in the watershed potentially containing pike.

5.2.5.1 Application of Chemicals to Lake and Tributaries Piscicide Emissions (Toxic and Odor-related Compounds)

The powdered formulation of rotenone does not contain solvents and therefore chemical emissions associated with the actual application and mixing of piscicides were not estimated using an overall material balance and WATER9 fate transfer equations for the air toxics compounds, as was conducted for the other alternatives proposing the use of liquid rotenone. A maximum of 260 gallons are expected to be required for the treatment of the tributaries depending on flow rates, background demand, sedimentation, amount of vegetation during application, whether temporary upstream fish barriers can be effectively constructed, and other factors. Based on the limited quantity of 260 gallons of liquid rotenone proposed for Alternative A, emissions were not calculated as they would be minimal for such a small quantity. Table 5.2-9 provides a summary of the Lake Davis characteristics at the Alternative A level. Table 5.2-10 provides the chemical application parameters for Alternative A.

Alternative A proposes to use powdered rotenone in Lake Davis. This would require mixing large quantities of powdered formula into a slurry-type media with water and injecting the mixture into the reservoir. While the mixing is being conducted, all staff in the vicinity would be required to wear personal protective equipment. Personnel mixing formulations would follow label (Federal Insecticide, Fungicide, and Rodenticide Act [FIFRA]) requirements necessary for protection from exposure to the formulation. If necessary, rotenone powder would be combined with sand and gelatin to form sand-gelatin-rotenone balls to treat large pools, seeps, and springs. The balls would be prepared at an off-site laboratory and delivered to the project site. When applying these balls, small amounts of powdered rotenone may be released into the air, but only pesticide applicators in the vicinity would be exposed.

Table 5.2-9. Reservoir Parameters – Alternative A

Alternative A Drain Reservoir to 15,000 Acre Feet		
Reservoir Parameters	**Parameter**	**Amount**
	Surface Area (Acres)	1,331
	Acre-Feet Water	15,000
	Depth (Feet)	11
	Surface Area (Square Feet)	57,978,586
Exposed Reservoir Bed	Acres	2,500

Table 5.2-10 Chemical Application Parameters – Alternative A (Powdered)

Piscicide Parameters		Total Amount Chemical In Reservoir
		Gallons: NA
	Neat Conc. in Formulation mg/L	Pounds: 40,541
Ingredient		Pounds Chemical In Formulation
CFT Legumine®		
Rotenone	Not Used in Reservoir	
Rotenolone		
Naphthalene		
1-Butylbenzene		
1-Methyl-2-pyrrolidinone		
Diethylene glycol monoethyl ether		
1,3,5-Trimethylbenzene		
sec-Butylbenzene		
Methylnaphthalene		
4-Isopropyltoluene		
Noxfish®		
Rotenone	Not Used in Reservoir	
Trichloroethylene		
Toluene		
1,3- and/or 1,4-Xylene		
1,2-Xylene		
Isopropyl benzene		
1-Propylbenzene		
1,3,5-Trimethylbenzene		
1,2,4-Trimethylbenzene		
1-Butylbenzene		
4-Isopropyltoluene		
Naphthalene		

Table 5.2-11 provides a summary of emissions on the maximum day (#/day) and for the entire project (main reservoir).

Table 5.2-11. Maximum Day (Acute) and Total Project Chemical Emissions – Alternative A

Chemical	Total Pounds Applied to Reservoir in Formulation	Total Pounds to Air Maximum Day (#/Day)	Total Pounds to Air Entire Project (#/Project)
CFT Legumine®			
Rotenone	Not Used in Reservoir		
Rotenolone			
Naphthalene			
1-Butylbenzene			
1-Methyl-2-pyrrolidinone			
Diethylene glycol monoethyl ether			
1,3,5-Trimethylbenzene			
sec-Butylbenzene			
Methylnaphthalene			
4-Isopropyltoluene			
Noxfish®			
Rotenone	Not Used in Reservoir		
Trichloroethylene			
Toluene			
1,3- and/or 1,4-Xylene			
1,2-Xylene			
Isopropyl benzene			
1-Propylbenzene			
1,3,5-Trimethylbenzene			
1,2,4-Trimethylbenzene			
1-Butylbenzene			
4-Isopropyltoluene			
Naphthalene			

Simplifying Assumptions

Assumptions are the same as those listed in Section 5.2.4.4 as they pertain to the powdered formulation of rotenone.

5.2.5.2 Application and Equipment Emissions (Priority Pollutants and Toxics)

During the application phase, temporary emissions would be generated by application and equipment operation used to implement the Alternative A. Application and equipment

emissions were estimated using the equipment fleet summary, anticipated application sequence, determination of maximum daily and overall project equipment utilization, estimated total fuel use and application of emission factors for typical engines.

Default emission values were used due to the mixed use of equipment, short-term (one day) application process and relatively short overall project length (three months). Application and equipment emissions estimates were applied to chemical application and equipment scenarios by using a fleet mix of equipment to be used during application activities: loaders, trucks, scrapers, backhoes, water trucks, generators, chemical mixing, chemical application, reservoir mixing, site security and associated staff logistics. In addition, on-site dust generation and worker transportation related emissions were estimated. Table 5.2-12 summarizes the priority pollutants associated with the three identified operations.

Table 5.2-12. Summary of Priority Pollutants from Application and Equipment Operations – Alternative A in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Transportation of Chemical to Reservoir	1	30	5	0.5	0.5
Mobile Combustion Equipment	607	28,870	953	42	63
Worker Vehicle (To/From Reservoir)	10	110	11	0	0
Total	618	29,010	969	43	64

Note:

Assumption all activities are occurring simultaneously

Source: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 2000

Emission Values for Portable and Stationary Engines SCAQMD AEIR 2005-2006 Default Setting

5.2.5.3 Dust and Particulate Emissions Associated with Exposed Reservoir Bed and Traffic on Unpaved Roads/Surfaces

Part of the project would require movement of various pieces of mobile equipment across unpaved roads and exposure of the reservoir bed during drawdown. SCAQMD CEQA Air Handbook - Chapter 9 defines the various air emission formulae and application methods to estimate the daily dust emissions. Calculation of particulate emissions from fugitive dust involves emissions from staging areas and the exposed surface of the reservoir bed. Table 5.2-13 summarizes the emissions associated with the site preparation and the exposed reservoir bed surface portion of the project.

Table 5.2-13. Fugitive Dust Emissions, General Equipment Activity and Exposed Reservoir Bed – Alternative A

Development of Temporary Staging Areas	Values
Temporary Staging Area[1]	1 acres graded/day
PM10 Emission Factor[2]	26.4#/acre/day
PM10 Maximum Day(uncontrolled)	26.4 #/day
PM 10 -Peak Daily (#/day)[3, 4]	14 #/day
Stock Pile Area(ft^2)	200 (site balanced)
Emission Factor for Stock Pile(#/ ft^2)	1.97#/1,000 (ft^2)[5]
Stock Pile Emissions (#PM_{10}/day)	0.4 #/day
Wind Erosion Reservoir Bed and Exposed Areas	**Values**
Exposed Surface of Reservoir Bed	2,500 acres
Estimated Surface of Reservoir Bed Disturbed By Application/Equipment Operation[6]	3% of Total (75 acres)
Estimated Surface Remained Undisturbed and Sufficient Moisture Content[7]	97% of Total (2,425 acres)
PM_{10} factor for disturbed area[2]	26.4#/acre/day
Total Expose Reservoir bed PM_{10} Emissions	1,980 pounds/day
Total PM_{10}	1,995 pounds/day

Notes:

1 Estimated area disturbed per day (250 x 250 feet), grading would occur on the first and/or second day, after which plastic mats or hay bales would be installed.

2 EPA MRI Report emission factor

3 Assume 50% dust control by water suppression

4 Most conservative daily emission

5 Emission factor A9-9-E SCAQMD Air Handbook

6 Emission factor Table A9-9 SCAQMD Air Handbook

7 Emission factor ratio (97/3) based on engineering assessment of disturbed areas

The estimated peak combined emissions of PM_{10} generated by site preparation and travel across the reservoir bed is 1,995 pounds per day.

5.2.5.4 Neutralization

Draft neutralization options are provided in Section 2.3.4 and in Appendix E. Neutralization of the rotenone would be accomplished by either curtailing dam outflow and allowing natural detoxification in the reservoir and its tributaries, or by applying potassium permanganate ($KMnO_4$) to the dam's discharge water in Big Grizzly Creek. The strategies include four options, some of which propose water pumping with small ½ to 1 hp electric pumps, which would not produce air emissions. The air emissions impact of adding potassium permanganate ($KMnO_4$) would primarily be localized fugitive emissions depending on the proposed mixing and application practices. Based on good handling practices and the inorganic composition of permanganate, the emission of permanganate would be assumed practically non-detectable.

5.2.5.5 Reservoir Level Reduction (Pumping and/or Supplemental Power)

In most water years (27 out of 38 years of record) additional pumping is not anticipated for Alternative A to lower the reservoir to the 15,000 acre-foot volume (see Table 2.10-1).

5.2.5.6 Fish Removal and Transportation

During the application process, dead fish would float to the surface and wash up on shore. It is estimated that approximately 100 tons of fish would be killed. Dead fish that float to the top of the reservoir or wash up on shore would be picked up for disposal. All dead fish that are retrieved would be loaded into a truck and hauled to a landfill (or other pre-approved facility). The proposed landfill is approximately 60 miles from Lake Davis.

It is assumed that each truck trailer (two trailers per truck) would haul approximately five tons of fish with silt carry-over to the landfill. A maximum day of fish retrieval is estimated to be two loads per truck. It is expected to take five days to haul the estimated 100 tons of dead fish. Table 5.2-14 summarizes the gathering, loading and transportation of the dead fish based on two truck loads.

Table 5.2-14: Summary of Priority Pollutants from Removal and Transportation of Dead Fish – Alternative A in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Gathering Dead Fish + Equipment to Load Trucks	5	16	42	4	3
Truck Trips to Landfill	2	60	10	1	1
Total Pounds per Day	**7**	**76**	**52**	**5**	**4**
Total Pounds per Project[1]	**35**	**380**	**260**	**25**	**20**

Note:

Based on two truck trips per day of 5 tons of fish each (two trailers per truck), for a total of five days to haul 100 tons.

Source: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 1993

5.2.5.7 Overall Project Pollutant Emissions

Table 5.2-15 below lists the daily project emissions for Alternative A for the priority pollutants.

Table 5.2-15. Summary of Priority Pollutants for Alternative A in Pounds per Day

Emission Source Category	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Application and Equipment Operations	618	29,010	969	43	64
Fugitive Dust Emissions	--	--	--	--	1,995
Removal and Transport of Dead Fish	35	380	260	25	20
Total Pounds per day	**653**	**29,390**	**1,229**	**68**	**2,079**

5.2.5.8 Potential Impacts

Impacts and minimization techniques for Alternative A are identical to those identified for the Proposed Project. Impacts AQ-1, AQ-2, and AQ-3 would apply to Alternative A, in addition to AQ-4, described below. *However, the odor impacts from AQ-1 would be limited to dead fish and the smaller amounts of liquid rotenone used for the tributaries and streams, as powdered rotenone proposed for the reservoir does not emit an odor.*

Powdered Rotenone Dust

Alternative A proposes to use a powdered form of rotenone for the eradication process, requiring mixing large quantities of powdered formula into a slurry-type media with water and injecting the mixture into the reservoir. While the mixing is being conducted, all staff in the vicinity would be required to wear personal protective equipment and follow label directions for safety.

Impact AQ-4: Alternative A would create dust from the use of powdered rotenone. The adverse impact is considered less than significant with the implementation of minimization measures described above.

Mitigation AQ-4: No mitigation is required.

5.2.6 Alternative B: 5,000 Acre-Feet (Plus Treatment)

Under Alternative B, the reservoir would be drawn down to 5,000 acre-feet and a liquid rotenone formulation would be applied throughout the reservoir, tributary streams, and any pools, ponds or springs in the watershed potentially containing northern pike. Project implementation would begin with reservoir drawdown, followed by rotenone application between mid-August and late October of 2007. The open water of the reservoir, the reservoir shoreline areas, tributary streams, and springs would be treated as described below. At a volume of 5,000 acre-feet, the surface elevation of Lake Davis is 5,738 feet above sea level and the surface area is approximately 545 acres.

5.2.6.1 Application of Chemicals to Reservoir and Tributaries Piscicide Emissions (Toxic and Odor-related Compounds)

Chemical emissions associated with the actual application and mixing of piscicides were estimated using an overall material balance and WATER9 fate transfer equations for the air toxics compounds. The chemicals of concern screening list (ENTRIX 2006d) for the application of rotenone include: n-methylpyrrolidone, naphthalene, toluene, and trichloroethylene. The entire chemical composition was evaluated to determine predictive worst-case emissions for both chemicals under consideration. Table 5.2-16 provides a summary of the Lake Davis characteristics at the proposed alternative level. In addition, the exposed shore and reservoir bed quantity is also included. Table 5.2-17 provides the chemical application parameters for Alternative B.

If necessary, rotenone powder would be combined with sand and gelatin to form sand-gelatin-rotenone balls to treat large pools, seeps, and springs. The balls would be prepared at an off-site laboratory and delivered to the project site. When applying these balls, small

amounts of powdered rotenone may be released into the air, but only pesticide applicators in the vicinity would be exposed.

Table 5.2-16. Reservoir Parameters – Alternative B

Alternative B – Drain Reservoir to 5,000 Acre-Feet		
Reservoir Parameters	**Parameter**	**Amount**
	Surface Area (Acres)	545
	Acre-Feet Water	5,000
	Depth (Feet)	9
	Surface Area (Square Feet)	23,740,293
Exposed Reservoir Bed	Acres	3,100

Table 5.2-17. Chemical Application Parameters – Alternative B

Piscicide Parameters		**Total Amount Chemical In Reservoir**
		Gallons: 1,670
	Neat Conc. In Formulation mg/L	**Pounds: 27,800**
Ingredient		**Pounds Chemical In Formulation**
CFT Legumine®		
Rotenone	43,200	606
Rotenolone	5,300	74
Naphthalene	350	4.9
1-Butylbenzene	80	1.1
1-Methyl-2-pyrrolidinone	90,000	1,263
Diethylene glycol monoethyl ether	569,000	7,986
1,3,5-Trimethylbenzene	4	0.06
Sec-Butylbenzene	4	0.05
Methylnaphthalene	140	2.0
4-Isopropyltoluene	5	0.07
Noxfish®		
Rotenone	50,000	702
Trichloroethylene	73	1.0
Toluene	1,800	24
1,3- and/or 1,4-Xylene	610	8.6
1,2-Xylene	76	1.1
Isopropyl benzene	52	0.73
1-Propylbenzene	310	4.4
1,3,5-Trimethylbenzene	860	12
1,2,4-Trimethylbenzene	10,000	140
1-Butylbenzene	9,000	126
4-Isopropyltoluene	1,000	14
Naphthalene	70,000	983

Table 5.2-18 provides a summary of emissions on the maximum day (#/day) and for the entire project (main reservoir).

Table 5.2-18. Maximum Day (Acute) and Total Project Chemical Emissions – Alternative B

Chemical	Total Pounds Applied To Reservoir In Formulation	Total Pounds To Air Maximum Day (#/Day)	Total Pounds To Air Entire Project (#/Project)
CFT Legumine®			
Rotenone	606	6.0	6.0
Rotenolone	74	0.74	0.74
Naphthalene	4.9	2.1	2.92
1-Butylbenzene	1.1	0.69	0.83
1-Methyl-2-pyrrolidinone	1,263	62.5	75
Diethylene glycol monoethyl ether *	7,986	0	0
1,3,5-Trimethylbenzene	0.06	0.04	0.05
Sec-Butylbenzene	0.05	0.03	0.04
Methylnaphthalene	2.0	0.86	1.2
4-Isopropyltoluene	0.07	0.03	0.04
Noxfish®			
Rotenone	702	6.9	6.9
Trichloroethylene	1.0	0.84	0.91
Toluene	24	20	24
1,3- and/or 1,4-Xylene	8.6	4.3	5.5
1,2-Xylene	1.1	0.54	0.69
Isopropyl benzene	0.73	0.59	0.69
1-Propylbenzene	4.4	2.2	2.8
1,3,5-Trimethylbenzene	12	9.0	11
1,2,4-Trimethylbenzene	140	104	125
1-Butylbenzene	126	77	94
4-Isopropyltoluene	14	8.6	10.4
Naphthalene	983	428	583

Note:

* Diethylene glycol monoethyl ether is considered non-volatile and therefore no emissions would result.

Simplifying Assumptions:

Assumptions are the same as those listed in Section 5.2.4.4.

Use of Information

The emission estimates were used to evaluate the potential impact of emissions on nearby receptors and/or worker safety and health. Please see Section 14 for a discussion of potential risks to human health and ecology.

5.2.6.2 Application and Equipment Emissions (Priority Pollutants and Toxics)

During the application phase, temporary emissions would be generated by the application and equipment operation used to implement the alternative. Application and other equipment emissions were estimated using the equipment fleet summary, anticipated application sequence, determination of maximum daily and overall project equipment utilization, estimated total fuel use and application of emission factors for typical engines.

Default emission values were used due to the mixed use of equipment, short-term (one day) application process and relatively short overall project length (three months). Application and equipment emissions estimates were applied to chemical application and equipment scenarios by using a fleet mix of equipment to be used during application activities: loaders, trucks, scrapers, backhoes, water trucks, generators, chemical mixing, chemical application, reservoir mixing, site security and associated staff logistics. In addition, on-site dust generation and worker transportation related emissions were estimated. Table 5.2-19 summarizes the priority pollutants associated with the three identified operations.

Table 5.2-19. Summary of Priority Pollutants from Application and Equipment Operations – Alternative B in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Transportation of Chemical to Reservoir	1	22	4	0.4	0.5
Mobile Combustion Equipment	576	24,772	1,350	43.9	91.5
Worker Vehicle (To/From Reservoir)	7	83	8	0	0
Total	584	24,872	1,362	44.3	92

Note:

Assumption: all activities are occurring simultaneously

***Source**: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 2000*

Emission Values for Portable and Stationary Engines SCAQMD AEIR 2005-2006 Default Setting

5.2.6.3 Dust and Particulate Emissions Associated with Exposed Reservoir bed and Traffic on Unpaved Roads/Surfaces

Part of the project would require movement of various pieces of mobile equipment across unpaved roads and the exposure of the reservoir bed during drawdown. SCAQMD CEQA Air Handbook - Chapter 9 defines the various air emission formulae and application methods to estimate the daily dust emissions. Calculation of particulate emissions from fugitive dust involves emissions from staging areas and the exposed surface of the reservoir bed. Table

5.2-20 summarizes the emissions associated with the site preparation and the exposed reservoir bed surface portion of the project.

Table 5.2-20. Fugitive Dust Emissions – General Equipment Activity and Exposed Reservoir Bed – Alternative B

Development of Temporary Staging Areas	Values
Temporary Staging Area[1]	1 acre graded/day
PM_{10} Emission Factor[2]	26.4#/acre/day
PM_{10} Maximum Day(uncontrolled)	26.4#/day
PM_{10} -Peak Daily (#/day)[3, 4]	14#/day
Stock Pile Area (ft^2)	200 (site balanced)
Emission Factor for Stock Pile (#/ft^2)	1.97#/1,000 (ft^2)[5]
Stock Pile Emissions (#PM_{10}/day)	0.4#/day
Wind Erosion Reservoir bed and Exposed Areas	**Values**
Exposed Surface of Reservoir bed	3,100 acres
Estimated Surface of Reservoir bed Disturbed By Application/Equipment Operation[6]	3% of Total (93 acres)
Estimated Surface Remained Undisturbed and Sufficient Moisture Content[7]	97% of Total (3,007 acres)
PM_{10} factor for disturbed area[2]	26.4#/acre/day
Total Expose Reservoir bed PM_{10} Emissions	2,455 pounds/day
Total PM_{10}	2,460 pounds/day

Notes:
1 Estimated area disturbed per day (250 x 250 feet), grading would occur on the first and/or second day, after which plastic mats or hay bales would be installed.
2 EPA MRI Report emission factor
3 Assume 50% dust control by water suppression
4 Most conservative daily emission
5 Emission factor A9-9-E SCAQMD Air Handbook
6 Emission factor Table A9-9 SCAQMD Air Handbook
7 Emission factor ration (97/3) based on engineering assessment of disturbed areas

The estimated peak combined emissions of PM_{10} generated by site preparation and travel across the reservoir bed is 2,460 pounds per day.

5.2.6.4 Neutralization

Draft neutralization options are provided in Section 2.3.4 and in Appendix E. Neutralization of the rotenone would be accomplished by either curtailing dam outflow and allowing natural detoxification in the reservoir and its tributaries, or by applying $KMnO_4$ to the dam's discharge water in Big Grizzly Creek. The strategies include four options, some of which propose water pumping with small ½ to 1 hp electric pumps, which would not produce air emissions. The air emissions impact of adding $KMnO_4$ would primarily be localized fugitive emissions depending on the proposed mixing and application practices. Based on good handling practices and the inorganic composition of permanganate, the emission of permanganate would be assumed practically non-detectable.

5.2.6.5 Reservoir Level Reduction (Pumping and/or Supplemental Power)

Additional pumping may be required to drain and maintain the reservoir to the required elevation in most water years. The pumps would be 88-hp electric submersible pumps that would discharge an average of 10 cfs each over the anticipated range of reservoir water levels during drawdown. The pumps would be located in the reservoir. The pumps would be powered by trailer mounted diesel generator sets located near the spillway. One 350 kw generator would be required for every three pumps. It is not possible to determine if any supplemental pumping would be required prior to commencement of the project in January 2007. See Table 2.10-1 for likelihood of target volume being reached.

Table 5.2-21 summarizes the estimated emissions from 3 350-kW generators operating at 17 gallons per hour, 24 hours per day.

Table 5.2-21. Summary of Priority Pollutants from Stationary Dewatering – Alternative B – in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Fuel Delivery for Generators	6.4	13.1	60	0.9	4.3
Temporary Power Generators	54	110	506	7.7	36
Total	**60.4**	**123.1**	**566**	**8.6**	**40.3**

Note:

3 350 kW (530 horsepower) generators operating at 17 gallons/hour (75% prime) and 24 hours/day; total estimated fuel per day is 1,224 gallons. Delivery requires 1,650 gallons every 1.34 days.

5.2.6.6 Fish Removal and Transportation

During the application process, dead fish would float to the surface and wash up on shore. It is estimated that approximately 100 tons of fish would be killed. Dead fish that float to the top of the reservoir or wash up on shore would be picked up for disposal. All dead fish that are retrieved would be loaded into a truck and hauled to a landfill (or other pre-approved facility). The proposed landfill is approximately 60 miles from Lake Davis.

It is assumed that each truck trailer (two trailers per truck) would haul approximately five tons of fish with silt carry-over to the landfill. A maximum day of fish retrieval is estimated to be two loads per truck. It is expected to take five days to haul the estimated 100 tons of dead fish. Table 5.2-22 summarizes the gathering, loading and transportation of the dead fish based on two truck loads.

Table 5.2-22. Summary of Priority Pollutants from Removal and Transportation of Dead Fish – Alternative B in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Gathering Dead Fish + Equipment to Load Trucks	5	16	42	4	3
Truck Trips to Landfill	2	60	10	1	1
Total Pounds per Day	**7**	**76**	**52**	**5**	**4**
Total Pounds per Project	**35**	**380**	**260**	**25**	**20**

Note: Based on two truck trips per day of 5 tons of fish each (two trailers per truck), for a total of five days to haul 100 tons.
***Source**: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 1993*

5.2.6.7 Overall Project Pollutant Emissions

Table 5.2-23 below lists the daily project emissions for Alternative B for the priority pollutants.

Table 5.2-23. Summary of Priority Pollutants for Alternative B in Pounds per Day

Emission Source Category	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Application and Equipment Operations	584	24,872	1,362	44.3	92
Fugitive Dust Emissions	--	--	--	--	2,460
Removal and Transport of Dead Fish	70	760	520	50	40
Total Pounds per day	**654**	**25,632**	**1,882**	**94.3**	**2,592**

5.2.6.8 Potential Impacts

Impacts and minimization techniques for Alternative B would be nearly identical to those identified for the Proposed Project in terms of air quality emissions. The reservoir level would be drawn down to 5,000 feet which would increase the amount of exposed reservoir bed and particulate emissions, but decrease the amount of rotenone required. Boat use would decrease by approximately one-third.

5.2.7 Alternative C: 35,000 Acre-Feet (Plus Treatment)

Under Alternative C, the reservoir would be drawn down to 35,000 acre-feet and liquid rotenone would be applied throughout the reservoir, tributary streams, and any pools, ponds or springs in the watershed potentially containing northern pike. Project implementation would begin with reservoir drawdown, followed by rotenone application between mid-August and late October of 2007. The open water of the reservoir, the reservoir shoreline areas, tributary streams, and springs would be treated as described below.

Noxfish® or CFT Legumine® is proposed for use. The liquid rotenone formulation would be applied at a rate and in a manner as described in the Proposed Project. At a volume of 35,000 acre-feet, the surface elevation of Lake Davis is 5,759 feet above sea level and the surface area is about 2,439 acres.

Amount of Pesticide Required

At the application rate of 0.33 gallon of Noxfish® or CFT Legumine® per acre foot of water, a 35,000 acre-feet reservoir volume would require 11,667 gallons of the formulation. A maximum of 230 gallons is expected to be required for the treatment of the tributaries depending on flow rates, background demand, sedimentation, amount of vegetation duration of application, whether temporary upstream fish barriers can be effectively constructed, and other factors.

5.2.7.1 Application of Chemicals to Reservoir and Tributaries Piscicide Emissions (Toxic and Odor-related Compounds)

Chemical emissions associated with the actual application and mixing of piscicides were estimated using an overall material balance and WATER9 fate transfer equations for the air toxics compounds. The chemicals of concern screening list (ENTRIX 2006a) for the application of rotenone include: n-methylpyrrolidone, naphthalene, toluene, and trichloroethylene. The entire chemical composition was evaluated to determine predictive worst-case emissions for both chemicals under consideration. Table 5.2-24 provides a summary of the Lake Davis characteristics at the Alternative C level. Table 5.2-25 provides the chemical application parameters for Alternative C.

If necessary, rotenone powder would be combined with sand and gelatin to form sand-gelatin-rotenone balls to treat large pools, seeps, and springs. The balls would be prepared at an off-site laboratory and delivered to the project site. When applying these balls, small amounts of powdered rotenone may be released into the air, but only pesticide applicators in the vicinity would be exposed.

Table 5.2-24. Reservoir Parameters – Alternative C

Alternative C Drain Reservoir to 35,000 Acre Feet		
Reservoir Parameters	**Parameter**	**Amount**
	Surface Area (Acres	2,439
	Acre-Feet Water	35,000
	Depth (Feet)	14
	Surface Area (Square Feet)	106,243,255
	Water (Gallons)	11,404,785,000
Exposed Reservoir Bed	Acres	500

Table 5.2-25. Chemical Application Parameters – Alternative C

Piscicide Parameters		Total Amount Chemical in Reservoir
		Gallons: 11,667
	Neat Conc. In Formulation mg/L	Pounds: 196,600
Ingredient		Pounds Chemical In Formulation
CFT Legumine®		
Rotenone	43,200	4,249
Rotenolone	5,300	521
Naphthalene	350	34
1-Butylbenzene	80	7.9
1-Methyl-2-pyrrolidinone	90,000	8,852
Diethylene glycol monoethyl ether	569,000	55,963
1,3,5-Trimethylbenzene	4	0.39
sec-Butyl benzene	4	0.38
Methylnaphthalene	140	14
4-Isopropyltoluene	5	0.5
Noxfish®		
Rotenone	50,000	4,249
Trichloroethylene	73	7.2
Toluene	1,800	177
1,3- and/or 1,4-Xylene	610	60
1,2-Xylene	76	7.5
Isopropyl benzene	52	5.1
1-Propylbenzene	310	31
1,3,5-Trimethylbenzene	860	85
1,2,4-Trimethylbenzene	10,000	984
1-Butylbenzene	9,000	885
4-Isopropyltoluene	1,000	98
Naphthalene	70,000	6,885

Table 5.2-26 provides a summary of emissions on the maximum day (#/day) and for the entire project (main reservoir).

Table 5.2-26. Maximum Day (Acute) and Total Project Chemical Emissions – Alternative C

Chemical	Total Pounds Applied To Reservoir In Formulation	Total Pounds To Air Maximum Day (#/Day)	Total Pounds To Air Entire Project (#/Project)
CFT Legumine®			
Rotenone	4,249	42	42
Rotenolone	521	5.1	5.1
Naphthalene	34	15	20.4
1-Butylbenzene	7.9	4.8	5.8
1-Methyl-2-pyrrolidinone	8,852	438	525
Diethylene glycol monoethyl ether*	55,963	0	0
1,3,5-Trimethylbenzene	0.39	0.30	0.33
sec-Butylbenzene	0.38	0.25	0.28
Methylnaphthalene	14	6.0	8.2
4-Isopropyltoluene	0.5	0.23	0.27
Noxfish®			
Rotenone	94,918	49	49
Trichloroethylene	7.2	5.9	6.4
Toluene	177	138	166
1,3- and/or 1,4-Xylene	60	30	39
1,2-Xylene	7.5	3.8	4.8
Isopropyl benzene	5.1	4.1	4.8
1-Propylbenzene	31	15	20
1,3,5-Trimethylbenzene	85	63	75
1,2,4-Trimethylbenzene	984	730	876
1-Butylbenzene	885	543	657
4-Isopropyltoluene	98	60	73
Naphthalene	6,885	2,997	4,087

Note:

* Diethylene glycol monoethyl ether is considered non-volatile and therefore no emissions would result.

Simplifying Assumptions

Assumptions are the same as those in Section 5.2.4.4.

Use of Information

The emission estimates were used to evaluate the potential impact of emissions on nearby receptors and/or worker safety and health. Please see Section 14 for a discussion of potential risks to human health and ecology.

5.2.7.2 Application and Equipment Emissions (Priority Pollutants and Toxics)

During the application phase, temporary emissions would be generated by the application and equipment operation used to implement the proposed alternative. Application and equipment emissions were estimated using the equipment fleet summary, anticipated application sequence, determination of maximum daily and overall project equipment utilization, estimated total fuel use and application of emission factors for typical engines.

Default emission values were used due to the mixed use of equipment, short-term (one day) application process, and relatively short overall project length (three months). Application and equipment emissions estimates were applied to chemical application and equipment scenarios by using a fleet mix of equipment to be used during application activities: loaders, trucks, scrapers, backhoes, water trucks, generators, chemical mixing, chemical application, reservoir mixing, site security and associated staff logistics. In addition, onsite dust generation and worker transportation related emissions were estimated. Table 5.2-27 summarizes the priority pollutants associated with the three identified operations.

Table 5.2-27. Summary of Priority Pollutants from Application and Equipment Operations – Alternative C in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Transportation of Chemical to Reservoir	1	30	5	0.5	0.5
Mobile Combustion Equipment	607	28,870	953	42	63
Worker Vehicle (To/From Reservoir)	10	110	11	0	0
Total	618	29,010	969	43	64

Note:

Assumption: all activities are occurring simultaneously

Source: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 2000

Emission Values for Portable and Stationary Engines SCAQMD AEIR 2005-2006 Default Setting

5.2.7.3 Dust and Particulate Emissions Associated with Exposed Reservoir bed and Traffic on Unpaved Roads/Surfaces

Part of the project would require movement of various pieces of mobile equipment across unpaved roads and exposure of the reservoir bed during drawdown. SCAQMD CEQA Air Handbook - Chapter 9 defines the various air emission formulae and application methods to estimate the daily dust emissions. Calculation of particulate emissions from fugitive dust involves emissions from staging areas and the exposed surface of the reservoir bed. Table 5.2-28 summarizes the emissions associated with the site preparation and exposed reservoir bed surface portion of the project.

Table 5.2-28. Fugitive Dust Emissions, General Equipment Activity and Exposed Reservoir bed – Alternative C

Development of Temporary Staging Areas	Values
Temporary Staging Area[1]	1 acres graded/day
PM10 Emission Factor[2]	26.4#/acre/day
PM10 Maximum Day(uncontrolled)	26.4 #/day
PM 10 –Peak Daily (#/day)[3, 4]	14 #/day
Stock Pile Area (ft^2)	200 (site balanced)
Emission Factor for Stock Pile (#/ ft^2)	1.97#/1,000 (ft^2)[5]
Stock Pile Emissions (#PM_{10}/day)	0.4 #/day
Wind Erosion Reservoir bed and Exposed Areas	**Values**
Exposed Surface of Reservoir bed	500 acres
Estimated Surface of Reservoir bed Disturbed By Application/Equipment Operation[6]	3% of Total (15 acres)
Estimated Surface Remained Undisturbed and Sufficient Moisture Content[7]	97% of Total (485 acres)
PM10 factor for disturbed area[2]	26.4#/acre/day
Total Expose Reservoir bed PM_{10} Emissions	**396 pounds / day**
Total PM_{10}	**411 pounds/day**

Notes:

1 Estimated area disturbed per day (250 x 250 feet), grading would occur on the first and/or second day, after which plastic mats or hay bales would be installed.

2 EPA MRI Report emission factor

3 Assume 50% dust control by water suppression

4 Most conservative daily emission

5 Emission factor A9-9-E SCAQMD Air Handbook

6 Emission factor Table A9-9 SCAQMD Air Handbook

7 Emission factor ration (97/3) based on engineering assessment of disturbed areas.

The estimated peak combined emissions of PM_{10} generated by the site preparation and travel across the reservoir bed is 15 pounds per day.

5.2.7.4 Neutralization

Draft neutralization options are provided in Section 2.3.4 and in Appendix E. Neutralization of the rotenone would be accomplished by either curtailing dam outflow and allowing natural detoxification in the reservoir and its tributaries, or by applying $KMnO_4$ to the dam's discharge water in Big Grizzly Creek. The strategies include four options, some of which propose water pumping with small ½ to 1 hp electric pumps, which would not produce air emissions. The air emissions impact of adding $KMnO_4$ would primarily be localized fugitive emissions depending on the proposed mixing and application practices. Based on good handling practices and the inorganic composition of permanganate, the emission of permanganate would be assumed practically non-detectable.

5.2.7.5 Reservoir Level Reduction (Pumping and/or Supplemental Power)

In most water years additional pumping is not anticipated for Alternative C to lower the reservoir to the 35,000 acre-foot volume (see Table 2.10-1).

5.2.7.6 Fish Removal and Transportation

During the application process, dead fish would float to the surface and wash up on shore. It is estimated that approximately 100 tons of fish would be killed. Dead fish that float to the top of the reservoir or wash up on shore would be picked up for disposal. All dead fish that are retrieved would be loaded into a truck and hauled to a landfill (or other pre-approved facility). The proposed landfill is approximately 60 miles from Lake Davis.

It is assumed that each truck trailer (two trailers per truck) would haul approximately five tons of fish with silt carry-over to the landfill. A maximum day of fish retrieval is estimated to be two loads per truck. It is expected to take five days to haul the estimated 100 tons of dead fish. Table 5.2-29 summarizes the gathering, loading and transportation of the dead fish based on two truck loads.

Table 5.2-29: Summary of Priority Pollutants from Removal and Transportation of Dead Fish – Alternative C in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Gathering Dead Fish + Equipment to Load Trucks	5	16	42	4	3
Truck Trips to Landfill	2	60	10	1	1
Total Pounds per Day	7	76	52	5	4
Total Pounds per Project	35	380	260	25	20

Note:
Based on two truck trips per day of 5 tons of fish each (two trailers per truck), for a total of five days to haul 100 tons.

Source: *Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 1993.*

5.2.7.7 Overall Project Pollutant Emissions

Table 5.2-30 below lists the daily project emissions for Alternative C for the priority pollutants.

Table 5.2-30. Summary of Priority Pollutants for Alternative C in Pounds per Day

Emission Source Category	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Application and Equipment Operations	618	29,010	969	43	64
Fugitive Dust Emissions	--	--	--	--	411
Removal and Transport of Dead Fish	35	380	260	25	20
Total Pounds per day	**653**	**29,390**	**1,189**	**68**	**495**

5.2.7.8 Potential Impacts

Impacts and minimization techniques for Alternative C would be similar to those identified for the Proposed Project in terms of air quality emissions. The reservoir would be drawn down to 35,000 feet, which would decrease the amount of exposed reservoir bed and therefore particulate emissions, but would require greater amounts of rotenone than the Proposed Project, and boat usage would nearly double, resulting in increased chemical and pollutant emissions.

5.2.8 Alternative D: 48,000 Acre-Feet (Plus Treatment)

Under Alternative D, the reservoir would be maintained at 48,000 acre-feet, and liquid rotenone would be applied throughout the reservoir, tributary streams, and any pools, ponds or springs in the watershed potentially containing northern pike. Project implementation would begin with rotenone application between mid-August and late October of 2007. The open water of the reservoir, the reservoir shoreline areas, tributary streams, and springs would be treated as described below. At a volume of 48,000 acre-feet, the surface elevation of Lake Davis is 5,764 feet above sea level and the surface area is about 2,936 acres.

5.2.8.1 Application of Chemicals to Reservoir and Tributaries Piscicide Emissions (Toxic and Odor-related Compounds)

Chemical emissions associated with the actual application and mixing of piscicides were estimated using an overall material balance and WATER9 fate transfer equations for the air toxics compounds. The chemicals of concern screening list (February 3, 2006) for the application of rotenone include: n-methylpyrrolidone, naphthalene, toluene, and trichloroethylene. The entire chemical composition was evaluated to determine predictive worst-case emissions for both chemicals under consideration. Table 5.2-31 provides a summary of the Lake Davis characteristics at the Alternative C level. In addition, the exposed shore and reservoir bed quantity is also included. Table 5.2-32 provides the chemical application parameters for Alternative D.

If necessary, rotenone powder would be combined with sand and gelatin to form sand-gelatin-rotenone balls to treat large pools, seeps, and springs. The balls would be prepared at an off-site laboratory and delivered to the project site. When applying these balls, small

amounts of powdered rotenone may be released into the air, but only pesticide applicators in the vicinity would be exposed.

Table 5.2-31. Reservoir Parameters – Alternative D

Alternative D –Drain Reservoir To 48,000 Acre Feet		
Reservoir Parameters	**Parameter**	**Amount**
	Surface Area (Acres)	2,936
	Acre-Feet Water	48,000
	Depth (Feet)	16
	Surface Area (Square Feet)	127,892,659
Exposed Reservoir bed	Acres	No change

Table 5.2-32. Chemical Application Parameters – Alternative D

Piscicide Parameters		**Total Amount Chemical in Reservoir**
		Gallons: 16,000
		Pounds: 267,000
Ingredient	**Neat Conc. in Formulation mg/L**	**Pounds Chemical In Formulation**
CFT Legumine®		
Rotenone	43,200	5,827
Rotenolone	5,300	715
Naphthalene	350	47
1-Butylbenzene	80	10.8
1-Methyl-2-pyrrolidinone	90,000	12,139
Diethylene glycol monoethyl ether	569,000	76,737
1,3,5-Trimethylbenzene	4	0.54
sec-Butyl benzene	4	0.53
Methylnaphthalene	140	19
4-Isopropyltoluene	5	0.69
Noxfish®		
Rotenone	50,000	6,744
Trichloroethylene	73	9.8
Toluene	1,800	243
1,3- and/or 1,4-Xylene	610	82
1,2-Xylene	76	10.3
Isopropyl benzene	52	7.0
1-Propylbenzene	310	42
1,3,5-Trimethylbenzene	860	116
1,2,4-Trimethylbenzene	10,000	1,349
1-Butylbenzene	9,000	1,214
4-Isopropyltoluene	1,000	135
Naphthalene	70,000	9,442

Table 5.2-33 provides a summary of emissions on the maximum day (#/day) and for the entire project (main reservoir).

Table 5.2-33. Maximum Day (Acute) and Total Project Chemical Emissions – Alternative D

Chemical	Total Pounds Applied To Reservoir In Formulation	Total Pounds to Air Maximum Day (#/Day)	Total Pounds To Air Entire Project (#/Project)
CFT Legumine®			
Rotenone	5,827	58	58
Rotenolone	715	7.1	7.1
Naphthalene	47	600	721
1-Butylbenzene	10.8	-	-
1-Methyl-2-pyrrolidinone	12,139	0.40	0.45
Diethylene glycol monoethyl ether*	76,737	0.32	0.39
1,3,5-Trimethylbenzene	0.54	6.6	8.0
sec-Butylbenzene	0.53	0.31	0.37
Methylnaphthalene	19	8.2	11.2
4-Isopropyltoluene	0.69	21	28
Noxfish®			
Rotenone	6,744	67	67
Trichloroethylene	9.8	821	8.8
Toluene	243	190	228
1,3- and/or 1,4-Xylene	82	42	53
1,2-Xylene	10.3	5.2	6.6
Isopropyl benzene	7	5.7	6.6
1-Propylbenzene	42	21	27
1,3,5-Trimethylbenzene	116	86	103
1,2,4-Trimethylbenzene	1,349	1,001	1,201
1-Butylbenzene	1,214	745	901
4-Isopropyltoluene	135	83	100
Naphthalene	9,442	4,110	5,604

Notes:

* Diethylene glycol monoethyl ether is considered non-volatile and therefore no emissions would result.

Simplifying Assumptions

Assumptions are the same as those in Section 5.2.4.4.

Use of Information

The emission estimates were used to evaluate the potential impact of emissions on nearby receptors and/or worker safety and health. Please see Section 14 for a discussion of potential risks to human health and ecology.

5.2.8.2 Application and Equipment Emissions (Priority Pollutants and Toxics)

During the application phase, temporary emissions would be generated by the application and equipment operation used to implement the alternative. Application and equipment emissions were estimated using the equipment fleet summary, anticipated application sequence, determination of maximum daily and overall project equipment utilization, estimated total fuel use and application of emission factors for typical engines.

Default emission values were used due to the mixed use of equipment, short-term (one day) application process and relatively short overall project length (three months). Application and equipment emissions estimates were applied to chemical application and equipment scenarios by using a fleet mix of equipment to be used during application activities: loaders, trucks, scrapers, backhoes, water trucks, generators, chemical mixing, chemical application, reservoir mixing, site security and associated staff logistics. In addition, on-site dust generation and worker transportation related emissions were estimated. Table 5.2-34 summarizes the priority pollutants associated with the three identified operations.

Table 5.2-34. Summary of Priority Pollutants from Application and Equipment Operations – Alternative D in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Transportation of Chemical to Reservoir	1	30	5	0.5	0.5
Mobile Combustion Equipment	607	28,870	953	42	63
Worker Vehicle (To/From Reservoir)	10	110	11	0	0
Total	**618**	**29,010**	**969**	**43**	**64**

Note:

Assumption is all activities are occurring simultaneously

Sources: *Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 2000*

Emission Values for Portable and Stationary Engines SCAQMD AEIR 2005-2006 Default Setting

5.2.8.3 Dust and Particulate Emissions Associated with Exposed Reservoir bed and Traffic on Unpaved Roads/Surfaces

Part of the project would require movement of various pieces of mobile equipment across unpaved roads and exposure of the reservoir bed during drawdown. SCAQMD CEQA Air Handbook - Chapter 9 defines the various air emission formulae and application methods to estimate the daily dust emissions. Calculation of particulate emissions from fugitive dust

involves emissions from staging areas and the exposed surface of the reservoir bed. Table 5.2-35 summarizes the emissions associated with the site preparation and exposed reservoir bed surface portion of the project.

Table 5.2-35. Fugitive Dust Emissions, General Equipment Activity and Exposed Reservoir bed – Alternative D

Development of Temporary Staging Areas	Values
Temporary Staging Area[1]	1 acres graded/day
PM_{10} Emission Factor[2]	26.4#/acre/day
PM_{10} Maximum Day(uncontrolled)	26.4 #/day
PM_{10} -Peak Daily (#/day)[3, 4]	14 #/day
Stock Pile Area (ft^2)	200 (site balanced)
Emission Factor for Stock Pile (#/ft^2)	1.97#/1000 (ft^2)[5]
Stock Pile Emissions (#PM_{10}/day)	0.4 #/day
Wind Erosion Reservoir bed and Exposed Areas	**Values**
Exposed Surface of Reservoir bed	0 acre
Estimated Surface of Reservoir bed Disturbed By Application/Equipment Operation[6]	0% of Total (75 acres)
Estimated Surface Remained Undisturbed and Sufficient Moisture Content[7]	100% of Total
PM_{10} factor for disturbed area[2]	26.4#/acre/day
Total Expose Reservoir bed PM_{10} Emissions	**0 pound/day**
Total PM_{10}	**15 pounds/day**

Notes:

1 Estimated area disturbed per day (250 x 250 feet), grading would occur on the first and/or second day, after which plastic mats or hay bales would be installed.

2 EPA MRI Report emission factor

3 Assume 50% dust control by water suppression

4 Most conservative daily emission

5 Emission factor A9-9-E SCAQMD Air Handbook

6 Emission factor Table A9-9 SCAQMD Air Handbook

7 Emission factor ration (97/3) based on engineering assessment of disturbed areas.

The estimated peak combined emissions of PM_{10} generated by the site preparation and travel across the reservoir bed is 15 pounds per day.

5.2.8.4 Neutralization

Draft neutralization options are provided in Section 2.3.4 and in Appendix E. Neutralization of the rotenone would be accomplished by either curtailing dam outflow and allowing natural detoxification in the reservoir and its tributaries, or by applying $KMnO_4$ to the dam's discharge water in Big Grizzly Creek. The strategies include four options, some of which propose water pumping with small ½ to 1 hp electric pumps, which would not produce air emissions. The air emissions impact of adding $KMnO_4$ would primarily be localized fugitive emissions depending on the proposed mixing and application practices. Based on good

handling practices and the inorganic composition of permanganate, the emission of permanganate would be assumed practically non-detectable.

5.2.8.5 Reservoir Level Reduction (Pumping and/or Supplemental Power)

Additional pumping would not be required to lower the reservoir to the 48,000 acre-foot elevation.

5.2.8.6 Fish Removal and Transportation

During the application process, dead fish would float to the surface and wash up on shore. It is estimated that approximately 100 tons of fish would be killed. Dead fish that float to the top of the reservoir or wash up on shore would be picked up for disposal. All dead fish that are retrieved would be loaded into a truck and hauled to a landfill (or other pre-approved facility). The proposed landfill is approximately 60 miles from Lake Davis.

It is assumed that each truck trailer (two trailers per truck) would haul approximately five tons of fish with silt carry-over to the landfill. A maximum day of fish retrieval is estimated to be two loads per truck. It is expected to take five days to haul the estimated 100 tons of dead fish. Table 5.2-36 summarizes the gathering, loading and transportation of the dead fish based on two truck loads.

Table 5.2-36. Summary of Priority Pollutants from Removal and Transportation of Dead Fish – Alternative D in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Gathering Dead Fish + Equipment to Load Trucks	5	16	42	4	3
Truck Trips to Landfill	2	60	10	1	1
Total Pounds per Day	**7**	**76**	**52**	**5**	**4**
Total Pounds per Project	**35**	**380**	**260**	**25**	**20**

Note:

Based on two truck trips per day of 5 tons of fish each (two trailers per truck), for a total of five days to haul 100 tons.

Source: *Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 1993.*

5.2.8.7 Overall Project Pollutant Emissions

Table 5.2-37 below lists the daily project emissions for Alternative D for the priority pollutants.

Table 5.2-37. Summary of Priority Pollutants for Alternative D in Pounds per Day

Emission Source Category	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Application and Equipment Operations	618	29,010	969	43	64
Fugitive Dust Emissions	--	--	--	--	15
Removal and Transport of Dead Fish	35	380	260	25	20
Total Pounds per day	**653**	**29,390**	**1,189**	**68**	**99**

5.2.8.8 Potential Impacts

Impacts and minimization techniques for Alternative D are similar to those identified for the Proposed Project. The reservoir would be managed to 48,000 feet, which would decrease or eliminate any additional exposed reservoir bed and greatly reduce particulate emissions, but which would require greater amounts of rotenone than the Proposed Project. Boat usage would nearly double.

5.2.9 Alternative E: Dewater Reservoir and Tributaries (No Chemical Treatment)

Under Alternative E, the eradication of northern pike from Lake Davis would be accomplished by completely draining the reservoir and all water sources flowing into it. Any water-filled depressions within the reservoir footprint, stream channels, overflow areas or other standing water areas would be drained. These systems would be maintained in a dry condition long enough to ensure that all pike were eliminated.

Each perennial stream would be dewatered using pumps and the flow diverted using pipes but without moving pike with the water. Water from streams would be diverted segment-by-segment to areas sequentially downstream. All springs and seeps within an isolated stream segment would have to be dewatered at the same time to ensure the pike could not move into an area that had been previously drained and thereby survive.

Draining Reservoir

Lake Davis would be drained using a combination of the existing reservoir outlet works and large capacity pumps. While most of the water in the reservoir would be drained through the existing outlet works, in months following a wet winter with high tributary inflows, the outlet may not have sufficient capacity to fully drain the reservoir and auxiliary pumping of the reservoir would be required. Also, pumps would be required to drain the reservoir dead pool (that portion of the reservoir which is below the lowest outlet gate in the reservoir) and to drain any pools created by depressions in the reservoir that would not drain by gravity flow. Access to the reservoir footprint would be necessary to place pumps. Helicopters are proposed for this task. Access to maintain pumps within the reservoir would be required during dewatering depending on the size and location of the pumps in the reservoir bottom.

5.2.9.1 Application of Chemicals to Reservoir and Tributaries, Piscicide Emissions (Toxic and Odor-related Compounds)

No treatment chemicals would be used for this alternative.

5.2.9.2 Equipment Emissions (Priority Pollutants and Toxics)

During the dewatering phase, temporary emissions would be generated by equipment and support vehicles used to implement the alternative. Equipment and support vehicle emissions were estimated using the Alternative E Equipment Fleet Summary, anticipated pipeline construction sequence, determination of maximum daily and overall project equipment utilization, estimated total fuel use and application of emission factors for typical engines. Proposed helicopter use for transporting heavy equipment is included in this fleet summary.

Default emission values were used due to the mixed use of equipment and relatively short overall project length (three months). Equipment emissions estimates were applied to equipment scenarios by using a fleet mix of equipment to be used during application and pipeline construction activities: loaders, trucks, scrapers, backhoes, water trucks, generators, helicopters, pumps, site security and associated staff logistics. In addition, on-site dust generation and worker transportation related emissions were estimated. Table 5.2-38 summarizes the priority pollutants associated with the three identified operations.

Table 5.2-38. Summary of Priority Pollutants from Application and Equipment Operations – Alternative E in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Transportation of Supplemental Dewatering Equipment to Reservoir	3	66	12	1.2	1.5
Mobile Combustion Equipment (Pipeline Construction / Application)	516	21,841	1,274	40	86.7
Worker Vehicle (To/From Reservoir)	7	83	8	0	0
Total	**526**	**21,990**	**1,294**	**41.2**	**88.2**

Note:

Assumption all pipeline construction related activities are occurring simultaneously

Source: *Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 2000*

Emission Values for Portable and Stationary Engines SCAQMD AEIR 2005-2006 Default Setting

5.2.9.3 Dust and Particulate Emissions Associated with Exposed Reservoir bed and Traffic on Unpaved Roads/Surfaces

Part of the project would require movement of various pieces of mobile equipment across unpaved roads and exposure of the reservoir bed during drawdown and fish removal.

SCAQMD CEQA Air Handbook - Chapter 9 defines the various air emission formulae and application methods to estimate the daily dust emissions. Calculation of particulate emissions from fugitive dust involves emissions from staging areas and the exposed surface of the reservoir bed. Table 5.2-39 summarizes the emissions associated with the site preparation and exposed reservoir bed surface portion of the project.

Table 5.2-39. Fugitive Dust Emissions, General Equipment Activity and Exposed Reservoir bed – Alternative E

Development of Temporary Staging Areas	Values
Temporary Staging Area[1]	1 acres graded/day
PM_{10} Emission Factor[2]	26.4#/acre/day
PM_{10} Maximum Day(uncontrolled)	26.4#/day
PM_{10} -Peak Daily (#/day)[3, 4]	14#/day
Stock Pile Area(ft^2)	200 (site balanced)
Emission Factor for Stock Pile(#/ft^2)	1.97#/1,000 (ft^2)[5]
Stock Pile Emissions (#PM_{10}/day)	0.4#/day
Wind Erosion Reservoir bed and Exposed Areas	**Values**
Exposed Surface of Reservoir bed	3,500 acres
Estimated Surface of Reservoir bed Disturbed By Application/ Pipeline Construction Operation[6]	4% of Total (140 acres)
Estimated Surface Remained Undisturbed and Sufficient Moisture Content[7]	96% of Total 3,360
PM_{10} factor for disturbed area[2]	26.4#/acre/day
Total Expose Reservoir bed PM_{10} Emissions	3,670 pounds/day
TOTAL PM_{10}	3,685 pounds/day

Notes:

1 Estimated area disturbed per day (250 x 250 feet), grading would occur on the first and/or second day, after which plastic mats or hay bales would be installed.

2 EPA MRI Report emission factor

3 Assume 50% dust control by water suppression

4 Most conservative daily emission

5 Emission factor A9-9-E SCAQMD Air Handbook

6 Emission factor Table A9-9 SCAQMD Air Handbook

7 Emission factor ration (97/3) based on engineering assessment of disturbed areas.

The estimated peak combined emissions of PM_{10} generated by the site preparation and travel across the reservoir bed is 3,685 pounds per day.

5.2.9.4 Neutralization

Neutralization is not required for this alternative.

5.2.9.5 Reservoir Level Reduction (Pumping and/or Supplemental Power)

Additional pumping would be required to drain and maintain the reservoir to the 0 acre-foot elevation. Table 5.2-40 summarizes the estimated emissions from 3 350-kW generators operating at 17 gallons per hour, 24 hours per day.

Table 5.2-40: Summary of Priority Pollutants from Stationary Dewatering – Alternative E – in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Fuel Delivery for Generators	6.4	13.1	60	0.9	4.3
Temporary Power Generators	54	110	506	7.7	36
Total	**60.4**	**123.1**	**566**	**8.6**	**40.3**

Note: 3 350-kW (530 horsepower) generators operating at 17 gallons/hour (75% prime) and 24 hours/day; total estimated fuel per day is 1,224 gallons. Delivery requires 1,650 gallons every 1.34 days.

5.2.9.6 Fish Removal and Transportation

During the dewatering process, dead fish would float to the surface and wash up on shore. It is estimated that approximately 100 tons of fish would be killed. Dead fish that float to the top of the reservoir or wash up on shore would be picked up for disposal. All dead fish that are retrieved would be loaded into a truck and hauled to a landfill (or other pre-approved facility). The proposed landfill is approximately 60 miles from Lake Davis.

It is assumed that each truck trailer (two trailers per truck) would haul approximately five tons of fish with silt carry-over to the landfill. A maximum day of fish retrieval is estimated to be two loads per truck. It is expected to take five days to haul the estimated 100 tons of dead fish. Table 5.2-41 summarizes the gathering, loading and transportation of the dead fish based on two truck loads.

Table 5.2-41. Summary of Priority Pollutants from Removal and Transportation of Dead Fish – Alternative E in Pounds per Day

Emission Source	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Gathering Dead Fish + Equipment to Load Trucks	12.5	40	105	10	7.5
Truck Trips to Landfill	5	150	25	2.5	2.5
Total Pounds per Day	**17.5**	**190**	**130**	**12.5**	**10**
Total Pounds per Project	**87.5**	**950**	**650**	**62.5**	**50**

Note: Based on two truck trips per day of 5 tons of fish each (two trailers per truck), for a total of five days to haul 100 tons.
***Source**: Estimations of Construction Related Emissions using South Coast Air Quality Management District CEQA Assessment Guide 1993.*

5.2.9.7 Overall Project Pollutant Emissions

Table 5.2-42 below lists the daily project emissions for Alternative E for the priority pollutants.

Table 5.2-42. Summary of Priority Pollutants for Alternative E in Pounds per Day

Emission Source Category	Reactive Hydrocarbon	Carbon Monoxide	Oxides of Nitrogen	Sulfur Dioxide	Particulates
Application and Equipment Operations	526	21,990	1,294	41.2	88.2
Fugitive Dust Emissions	--	--	--	--	3,685
Removal and Transport of Dead Fish	87.5	950	650	62.5	50
Total Pounds per day	**613.5**	**22,940**	**1,944**	**103.7**	**38,232**

5.2.9.8 Potential Impacts and Mitigation Measures

Sensitive Receptors Exposure

Impacts to sensitive receptors for Alternative E are identical to AQ-1 for the Proposed Project. Although chemicals are not proposed, the use of the pumps to drain the reservoir result in emissions that are similar to the emissions from the equipment used to deliver chemicals. The DFG should plan to use alternative fuels to traditional diesel fuel where feasible to reduce the emissions, and specifically toxic emissions, from the equipment operation.

Objectionable Odors

Impacts from objectionable odors from dead fish for Alternative E are identical to AQ-2 for the Proposed Project.

In order to minimize the effects of objectionable odors to a substantial number of people, the DFG would implement a “Dead Fish Disposal and Removal Plan” in order to capture and remove the deceased fish as quickly as possible to minimize exposure to objectionable odors.

Fugitive Dust

Impacts from fugitive dust for Alternative E are identical to AQ-3 for the Proposed Project based on the amount of equipment proposed and the significantly increased exposure of the reservoir bed.

5.2.9.9 Cumulative Impacts

A cumulative impact analysis takes into consideration impacts which may be created as a result of combining the Proposed Action with other related programs or projects that have impacts. At issue is whether there is a considerable cumulative impact on air quality. Although the Lake Davis Pike Eradication Project’s incremental impacts from the use of

vehicles and equipment to carry forth an eradication method are individually limited, could they be considered cumulatively considerable? The conclusion is that they are not cumulatively considerable as explained below.

Definition of Analysis Area

The project area includes the entire Davis Lake watershed, and Big Grizzly Creek from Grizzly Valley Dam to its confluence with the Middle Fork Feather River in Plumas County.

List of Projects Considered in the Cumulative Impacts Analysis

Previous, present, or future projects and actions listed in Section 1.8 that were considered in this cumulative impact analysis for air quality include:

- City of Portola well-drilling
- Grizzly Ranch Development Project
- Beckwourth Ranger District Tall Whitetop Project
- Westside Lake Davis Watershed Restoration Project
- Forest Service Road 24N10 Chip Seal Project
- Timber Harvest Projects
- USFS Forest and Fuels Management Projects

This analysis describes the potential cumulative impacts of the Proposed Project and Alternatives A through E on air quality when considered in combination with other past, present, and reasonably foreseeable actions and baseline conditions.

A brief description of the time period and likely impacts of other projects considered in this analysis is provided below.

Cumulative Impacts for the Proposed Action

City of Portola Well-drilling

Limited details are available for this project. During the construction period there could be adverse air quality impacts that, when combined with the air quality impacts from the pike eradication project, could result in a significant impact to nearby sensitive receptors. These impacts would only occur if the construction process for both projects occurred simultaneously in 2007. If the construction process for the well-drilling project occurs simultaneously with the Proposed Project, the cumulative impact would be significant but mitigable. Mitigation would include the creation of a schedule so that both projects would not result in simultaneous air quality impacts. This mitigation is sufficient to reduce the impact to not cumulatively considerable.

Grizzly Ranch Development Project

The Grizzly Ranch Development Project is a residential subdivision that includes 380 homes on 1,042 acres, including a golf course. Construction of the project is currently underway. During the construction period there could be adverse air quality impacts that, when combined with the air quality impacts from the pike eradication project, could result in a significant impact to nearby sensitive receptors. These impacts would only occur if the construction process for both projects occurred simultaneously in 2007. If the construction process for the Grizzly Ranch Development Project occurs simultaneously with the Proposed Project, the cumulative impact would be significant but mitigable. Mitigation would include the creation of a schedule so that both projects would not result in simultaneous air quality impacts. This mitigation is sufficient to reduce the impact to not cumulatively considerable.

Beckwourth Ranger District Tall Whitetop Project

Limited details have been provided for this project, but potential impacts to air quality from this project would be emissions from proposed combustion equipment used to maintain the area such as trimmers and mowers. During the project there could be adverse air quality impacts that, when combined with the air quality impacts from the pike eradication project, could result in a significant impact to nearby sensitive receptors. These impacts would only occur if the construction process for both projects occurred simultaneously in 2007. If the construction process for the Whitetop Project occurs simultaneously with the Proposed Project, the cumulative impact would be significant but mitigable. Mitigation would include the creation of a schedule so that both projects would not result in simultaneous air quality impacts. This mitigation is sufficient to reduce the impact to not cumulatively considerable.

Westside Lake Davis Watershed Restoration Project

The project consists of the restoration of 50 head-cuts and gullies to improve channel stability and reduce sedimentation within 20 stream channels along the west side of Lake Davis. During the construction period there could be adverse air quality impacts that, when combined with the air quality impacts from the pike eradication project, could result in a significant impact to nearby sensitive receptors. These impacts would only occur if the construction process for both projects occurred simultaneously. If the construction process for the Restoration Project occurs simultaneously with the Proposed Project, the cumulative impact would be significant but mitigable. Mitigation would include the creation of a schedule so that both projects would not result in simultaneous air quality impacts. This mitigation is sufficient to reduce the impact to not cumulatively considerable.

Forest Service Road 24N10 Chip Seal Project

The US Forest Service, Plumas National Forest, Beckwourth Ranger District proposes to chip seal approximately 1.8 miles of the 24N10 road on National Forest land near the western shore of Lake Davis. This project is scheduled for 2006. The project includes culvert installations, clearing, crack sealing and asphalt patching, aggregate placement, and chip sealing. During the construction period there could be adverse air quality impacts that, when combined with the air quality impacts from the pike eradication project, could result in a

significant impact to nearby sensitive receptors. These impacts would only occur if the construction process for both projects occurred simultaneously. If the construction process for the Chip Seal Project occurs simultaneously with the Proposed Project, the cumulative impact would be significant but mitigable. Mitigation would include the creation of a schedule so that both projects do not result in simultaneous air quality impacts. This mitigation is sufficient to reduce the impact to not cumulatively considerable.

Timber Harvest Projects

The impacts of timber harvesting in the analysis area have been continuous for some time, dating back to the early 1900s and continuing to the present. Depending on the type of equipment proposed, this project is not expected to result in cumulative impacts. The cumulative impact of timber harvest projects is less than significant.

USFS Forest and Fuels Management Projects

In addition to timber harvest projects, the USFS conducts forest and fuels management activities in the analysis area. This includes reduction in fire hazard through tree removal, thinning for forest health, salvage cutting, pole cutting, tree planting, public fuel wood-cutting, and prescribed burns. These types of activities have occurred since approximately 1980. Impacts are similar to the timber harvest impacts, except there could be adverse air quality impacts that, when combined with the air quality impacts from the pike eradication project, could result in a significant impact to nearby sensitive receptors. These impacts would only occur if the construction process for both projects occurred simultaneously. The cumulative impact of USFS forest and fuels management projects is less than significant.

Cumulative Impacts Analysis for Alternative A

Cumulative impacts of Alternative A are the same as for the Proposed Project.

Cumulative Impacts Analysis for Alternative B

Cumulative impacts of Alternative B are the same as for the Proposed Project.

Cumulative Impacts Analysis for Alternative C

Cumulative impacts of Alternative C are the same as for the Proposed Project.

Cumulative Impacts Analysis for Alternative D

Cumulative impacts of Alternative D are the same as for the Proposed Project.

Cumulative Impacts Analysis for Alternative E

Cumulative impacts of Alternative E are the same as for the Proposed Project.

Conclusion

Under the Proposed Project and all of the project alternatives, the combined impact of past, present, and reasonably foreseeable projects with the project/action alternatives would not result in cumulative impacts for air quality in the Lake Davis area. There would not be cumulatively considerable impacts since most of the relevant projects described above would not occur simultaneously with the eradication project. The Grizzly Ranch Development Project and the Forest Service Road 24N10 Chip Seal Project may cause an increase in emissions, including fugitive dust, in the project area, however it is unlikely that these projects would occur at the same time as the pike eradication project. Timing the projects so those construction periods differ could mitigate potential cumulative impacts resulting from simultaneous construction periods.

5.2.10 Environmental Impacts Summary

Impacts for the Proposed Project and Alternatives A, B, C, D, and E are less than significant. Alternative D would result in the least emissions of all the alternatives based on it involving the least amount of exposed reservoir bed. Table 5.2-43 summarizes the results of the impact analyses for both CEQA and NEPA determinations.

Table 5.2-43. Summary Comparison of Impacts of Alternatives

Affected Resource and Area of Potential Impact	Alternative						
	No Project Compared to Existing Conditions	Proposed Action	A	B	C	D	E
Air Quality							
1. Objectionable odors to sensitive receptors from rotenone application and decaying fish	N	LS, A	LS, A[1]	LS, A	LS, A	LS, A	LS, A
2. Elevated levels of air pollutant emissions from equipment required for application (including dewater)	N	LS, A	LS, A	LS, A	LS, A	LS, A	LS, A
3. Particulate dust from construction-type activities	N	LS, A	LS, A	LS, A	LS, A	LS, A	LS, A
4. Dust from powdered rotenone application	N	na	LS, A	na	na	na	na

Key:

A = Adverse Impact (NEPA)
LS = Less than Significant Impact (CEQA)
N = No Impact (CEQA, NEPA)
na = Not Applicable
SM = Significant but Mitigatable Impact (CEQA)

1 = There would be no odor from the application of powdered rotenone as proposed for Alternative A, although liquid rotenone would still be used to treat streams and tributaries.

5.3 Monitoring

Monitoring of air pollutants would be conducted during and after the Project. Details of the air quality monitoring program would be developed and formalized as required by the NSAQMD and in consultation with Plumas County Environmental Health Department during the design phase of any approved project. The program would specify constituents to be monitored, monitoring methods, frequency of monitoring and location of monitoring stations.